United States Department of Agriculture

Animal and Plant Health Inspection Service

Gypsy Moth Cooperative Eradication Program in King, Pierce, Thurston, and Clark Counties, Washington

Environmental Assessment
March 2016

Gypsy Moth Cooperative Eradication Program in King, Pierce, Thurston, and Clark Counties, Washington

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I. Introduction

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), in cooperation with the Washington State Department of Agriculture (WSDA), are proposing to eradicate gypsy moth infestations in areas of King, Pierce, Thurston, and Clark Counties, Washington.

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

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

II. Purpose and Need

The purpose of the proposed action is for USDA, APHIS, in cooperation with WSDA, to eradicate gypsy moth infestations (AGM and EGM) located in areas in King, Pierce, Thurston, and Clark Counties in Washington. The AGM is the main target, but a high number of EGM were trapped at one location. Therefore, the EGM will be targeted at that site. See appendix 1 for maps of proposed treatment areas.

WSDA has conducted annual trapping and detection surveys for EGM and AGM in Washington since 1977. EGM has been detected in Washington almost every year since then, but no permanent populations of this destructive pest have been able to establish due to successful treatment programs. In the summer of 2015, WSDA trapped 32 EGM, the most caught since 2007, and also 10 AGM in western Washington (WSDA, 2016). This is the first time that AGM has been detected in Washington since 1999. The areas where gypsy moths were captured contain preferred host plants that are susceptible to defoliation by gypsy moths, and that could support successful reproduction and spread of the pest.

There is a need for this proposed action because if AGM were to become established in our country, the damage could be even more extensive and costly than that of the EGM which is established in the eastern United States. Unlike the flightless female EGM, AGM females are active fliers. Their ability to fly long distances makes it probable that AGM could quickly spread throughout the United States. Large infestations of AGM can completely defoliate trees, leaving them weak and more susceptible to disease or attack by other insects. In the Pacific Northwest, defoliation in riparian habitats could lead to increased water temperatures. If defoliation is repeated for two or more years, it can lead to the death of large sections of forests, orchards, and landscaping. Any introduction and establishment of AGM in the United States would pose a major threat to the environment and the urban, suburban, and rural landscapes. (From: APHIS, 2015)

The alternatives being considered have been analyzed in detail in the 1995 final environmental impact statement (EIS) for gypsy moth management in the United States and a recent supplemental EIS (USDA, 1995; 2012). This environmental assessment (EA) is tiered to those documents, and their findings regarding the alternatives now being considered will be summarized and incorporated by reference into this EA. Eradication is being proposed because of the isolated nature of these infestations and the threat that a reproducing population of gypsy moths would pose to the vegetation resources of this area.

This EA is prepared consistent with National Environmental Policy Act of 1969 (NEPA) (42 United States Code (U.S.C.) § 4231 et. seq.), the Council of Environmental Quality NEPA regulations (40 Code of Federal

Regulations (CFR) part 1500 et. seq.) and APHIS' NEPA implementing regulations (7 CFR part 372) for the purpose of evaluating how the proposed action and alternatives described in the following sections, if implemented, may affect the quality of the human environment. This EA is being made available to the general public and comments are requested from any interested party.

A. Public Outreach

WSDA has provided information and outreach to the public regarding the proposed program.

WSDA held meetings with public officials from December 23, 2015 to present with:

Thurston County Commission
Gig Harbor City Administrator
City of Olympia City Manager
City of Lacey staff
City of Seattle staff
City of Tacoma staff
Pierce County Executive
Presentation to Gig Harbor City Council
Presentation to Lacey City Council

WSDA has provided outreach via in person meetings to cooperating State and Federal agencies including:

Washington State Department of Ecology
Washington State Department of Health
Washington Department of Fish and Wildlife
Washington State Department of Natural Resources
Joint Base Lewis-McChord
U.S. Fish and Wildlife Service

WSDA has contacted affected persons via email and mail correspondence:

Letter to State legislators in affected areas emailed Nov. 17, 2015.
Stakeholder update emailed Nov. 20, 2015.
Postcard mailed to all affected residents on Jan. 6, 2016.

WSDA provides updates and information via social media, websites, and traditional media including:

Twitter updates (@WSDAgov) beginning Jan. 5, 2016.
WSDA Facebook posts (#GypsyMothMonday), every Monday beginning Jan. 4, 2016.
Press release dated Jan. 15, 2016, picked up by the Associated Press

and several local news outlets.
Local TV story and interview on Jan. 11, 2016
WSDA Gypsy moth activity update website located at
http://agr.wa.gov/plantsinsects/insectpests/gypsymoth/

WSDA has planned public open houses for each treatment area.

Gig Harbor (Feb. 17, 2016)
Seattle (Capitol Hill) (Feb. 24, 2016)
Vancouver (Mar. 1, 2016)
Tacoma (Mar. 10, 2016)
Lacey/Nisqually (Mar. 3, 2016)
Kent (Feb. 23, 2016)

B. Authorizing Laws

1. USDA Authorities

Authorization to conduct treatments for gypsy moth infestations is given in the Plant Protection Act of 2000 (7 U.S.C. section 7701), and the Cooperation with State Agencies in Administration and Enforcement of Certain Federal Laws (7 U.S.C. section 450). The Cooperative Forestry Assistance Act of 1978 (P.L. 95–313) provides the authority for Federal and State cooperation in managing forest insects and diseases. The 1990 Farm Bill (P.L. 101-624) reauthorizes the basic charter of the Cooperative Forestry Assistance Act. The NEPA of 1969 requires detailed environmental analysis of any proposed Federal action that may affect the human environment. The Federal Insecticide, Fungicide and Rodenticide Act of 1947, as amended, known as FIFRA, requires pesticides used within the United States be registered by the U.S. Environmental Protection Agency (EPA). Section 7 of the Endangered Species Act prohibits Federal actions from jeopardizing the continued existence of federally listed threatened, endangered, or candidate species or adversely affecting critical habitat of such species. Section 106 of the National Historical Preservation Act and 36 CFR part 800: Protection of Historic Properties requires the State Historic Preservation Officer be consulted regarding the proposed activities.

2. State Authorities

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

C. Decisions to be Made

The preferred alternative in this document proposes a multiagency approach between APHIS and WSDA. The responsible officials must decide the following:

- Should there be a cooperative treatment program, and if so, what type of treatment options should be used?

- Is the proposed action likely to have any significant impacts requiring further analysis in an EIS if treatments are to be implemented?

D. Responsible Officials

The responsible official for APHIS is:

Anthony Man-Son-Hing
National Gypsy Moth Policy Manager
USDA-APHIS
Plant Protection and Quarantine
920 Main Campus Drive
Raleigh, NC 27606

The responsible official for APHIS will make a decision before mid-April, 2016, to ensure timely funding for an effective program that meets the Cooperative Gypsy Moth Program's objectives on State, Tribal, and private lands in King, Pierce, Thurston, and Clark Counties for the proposed eradication program, if an action alternative is selected.

The official responsible for implementation for WSDA is:

Randy Taylor
Washington State Department of Agriculture
Natural Resources Building
P.O. Box 42560
1111 Washington St SE
Olympia, WA 98504-2560

E. Other Gypsy Moth Work

No additional gypsy moth eradication treatments are currently planned for elsewhere in Washington for 2016. In the event that there is a need for

additional treatments, a separate EA and decision notice will be issued for this work. There are proposed AGM eradication treatments planned in an adjacent Oregon county that may be coordinated with gypsy moth eradication treatments in Washington. The Oregon eradication program is being analyzed in a separate EA and will have a decision notice.

III. Alternatives

This EA is tiered to the USDA's 1995 Final EIS and 2012 supplemental EIS for Gypsy Moth Management in the United States. The preferred alternative in the 1995 EIS is alternative 6: Suppression, Eradication, and Slow the Spread. This alternative was proposed because of the isolated nature of gypsy moth infestations in Washington. This site-specific EA is designed to examine the environmental consequences of a range of treatment options listed under the EIS preferred alternative (alternative 6) that may accomplish the program's goal.

1) Btk—a biological insecticide containing the bacterium *Bacillus thuringiensis* var *kurstaki* (Btk). The insecticide is specifically effective against caterpillars of many species of moths and butterflies, including AGM and EGM.

2) Diflubenzuron (Dimilin®)—an insect growth regulator that interferes with the growth of some immature insects.

3) Tebufenozide—an insecticide that controls molting in various insects and other invertebrates.

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

5) Mass Trapping—a treatment that consists of large numbers of pheromone traps used to attract the male gypsy moth thus preventing them from mating with females and, thereby, causing a population reduction.

6) Mating Disruption—a treatment that consists of a carrier (i.e., tiny plastic flakes, beads, etc.) that releases disparlure, a synthetic gypsy moth sex pheromone. The pheromone confuses male moths and prevents them from locating and mating with females.

7) Sterile Insect Technology—a treatment that consists of an aerial release of a large number of sterile male gypsy moths. This reduces the chance that female moths will mate with fertile males, which results in progressively fewer and fewer fertile egg masses being produced, and

eventual elimination of the population.

Of the treatment options listed above, Btk and diflubenzuron have proven to be the most effective eradication tools for use with small populations of gypsy moths, such as the areas being proposed in this site-specific EA. However, diflubenzuron is an insect growth regulator that has a broader nontarget host range than Btk, and can kill many other insects in addition to moths and butterfly caterpillars. Because its use may adversely affect other insect populations it was not selected. Similar types of impacts would be expected with the use of tebufenozide, and thus, it was not selected as part of the proposed program either. Gypsy Moth virus (Gypcheck®) is very host-specific, but is not widely available in the market; therefore, it was not selected. Mating disruption was not selected because there is limited or no use-history of this method for gypsy moth eradication in Washington. Sterile insect release experiments show variable results for eradication programs and, consequently, use of sterile insects was not selected.

Therefore, this EA analyzes two alternatives (1) the no action alternative and (2) the proposed action that will use three to five aerial applications of Btk, combined with post-treatment delimiting trapping for two years for EGM and three years for AGM to ensure that the treatment is effective.

A. No Action

Under the no action alternative, gypsy moths would reproduce and populations would spread to surrounding areas. This is not a preferred alternative because environmental damage and regulatory action, such as intrastate, interstate, and foreign quarantines, would likely occur or will occur sooner than if the proposed action alternative was selected. If no action was taken, APHIS would not aid in the treatment of the area. Some control measures could be taken by other Federal and non-federal entities; however, these measures would neither be controlled nor funded by APHIS.

B. Proposed Action

Under the proposed action alternative, APHIS would provide funding for the proposed treatment areas. Btk (Foray® 48B, EPA Reg. No. 73049-427) will be applied via aerial application over the proposed treatment areas. Treatments will not be applied to aquatic areas. The proposed formulation is certified for organic production. Three to five applications of Btk will be applied with an interval of approximately three to 14 days between each application. These applications are estimated to begin sometime in mid-April 2016. The exact date of application will be timed so that the applications occur during the early larval stages when gypsy moth caterpillars hatch from their eggs and are most susceptible to treatments.

WSDA will notify occupants in the affected area about the upcoming eradication activities. WSDA offers a prior notification list upon which interested parties can request to be placed. Persons on the list will receive calls and/or e-mails or text messages the day before applications occur.

Pheromone-baited gypsy moth delimiting traps will be used to monitor success of the treatments. Trapping density will be as high as one trap per 250 square meters in each treatment area to determine if treatments are successful.

IV. Affected Environment

The total area of the treatment sites proposed for gypsy moth eradication is approximately 10,457 acres. Maps of the areas are available in Appendix 1 with a description of the areas below.

Vancouver (Clark County)

Human Health

The Vancouver treatment area is 807 acres in size. The area proposed for treatment encompasses the Port of Vancouver. The Port of Vancouver is the state's third-largest public port, after Seattle and Tacoma. It is located on the Columbia River. More than 2,300 people are directly employed by businesses at the port, and approximately 100 people are directly employed by the Port of Vancouver (POV, undated). No schools, hospitals, airports, or historic properties occur within the treatment area.

Ecological/Environmental Resources

Although a significant portion of the proposed area has been developed for human use there are several terrestrial and aquatic habitats that support a diversity of fish and wildlife species. Vancouver Lake and Columbia River border the treatment area.

Nisqually (Thurston County)

Human Health

The 640-acre site is located approximately 1 mile south of Interstate 5 on the west side of the Nisqually River. Old Pacific Highway runs through the center of the area. The site is comprised of residential, farming, commercial, and industrial land uses. Recreational opportunities in the area include fishing, boating, and walking trails.

Ecological/Environmental Resources

McAllister Creek (historically Medicine Creek) runs east/west through the proposed treatment area. The Nisqually River runs outside the proposed eastern boundary. Lost Lake is located outside of the proposed southern boundary.

Vegetation types in the treatment area include deciduous and evergreen trees, shrubs, grass, pasture, crops, orchards, wet soil plants, and water plants.

Lacey (Thurston County)

Human Health

This 640-acre proposed treatment site is located north of the Marvin Road NE exit (111) off Interstate 5, in the Hawks Prairie area of Lacey. This treatment site is comprised of residential housing, commercial sites, and Thurston County Waste and Recovery Center where residents can dispose of items including garbage, yard waste, recyclables, and hazardous household waste.

Ecological/Environmental Resources

There is a freshwater forested/shrub wetland in the southeast corner of the proposed site. There is also one freshwater forested/shrub wetland just outside the northern boundary of the proposed site. Hawks Prairie's Recharged Water Ponds/Recharge Basins are located just outside of the eastern boundary.

Vegetation types include deciduous and evergreen trees, shrubs, grass, wet soil plants, and aquatic plants.

Tacoma (King and Pierce Counties)

Human Health

The proposed Tacoma treatment area is approximately 7,000 acres, and is located in the Port of Tacoma, Norpoint, Fife, and Milton areas. Puyallup Tribal lands are within the proposed site. The site includes residential housing, commercial and industrial sites, several schools, parks, a church, farmland, and the Port of Tacoma. The Port is 2,400 acres in size; shipping terminal activity, warehousing, distributing, and manufacturing take place at the location.

Ecological/Environmental Resources

The Port of Tacoma is part of one of the largest superfund environmental remediation sites in Washington, namely the Commencement Bay Nearshore/Tideflats Site (WSDE, undated). This site has been polluted from a variety of industries that operated on the Bay. The Hylebos Waterway is located on the northeast side of the Port of Tacoma and is tidally affected by Commencement Bay.

Critical habitat for bull trout and Chinook salmon occurs adjacent to the treatment area.

Vegetation types in the proposed treatment are comprised of deciduous and evergreen trees, shrubs, grass, pasture, crops, orchards, wet soil plants, and aquatic plants.

Kent (King County)

Human Health

The Kent treatment area is 640 acres in size, and is comprised of residential, commercial, and industrial areas as well as parks including the Green River Natural Resources Area (GRNRA) and the Valley Floor Community Park (VCFP). Visitors to the 922-acre Green River Natural Area engage in activities such as walking, bicycling, nature observation, horseback riding, rafting, tubing, and kayaking. The Green River Trail follows the Green River through industrial lands near the Duwamish Waterway in Tukwila to the Green River Valley and part of the trail occurs in the treatment area. The trail provides views and access to the Green River and surrounding river valley. The Boeing Company occupies a portion of the treatment area.

Ecological/Environmental Resources

The Green River runs through this treatment area. Portions of the GRNRA and the VFCP are also within the boundaries of this area. The GRNRA is a former abandoned sewage lagoon system that was transformed into a combined storm water detention and enhanced wetland facility, and is one of the largest man-made, multi-use wildlife refuges in the United States (City of Kent, 2016). Approximately 165 bird and 53 mammal species use the GRNRA as a nesting, breeding, and feeding area (City of Kent, 2016). The approximately 43-acre VFCP is located on the west bank of the Green River, and is an undeveloped community park with open space and wetlands.

Critical habitat for bull trout and Chinook salmon in the Green River occurs within the treatment area. Other fish species on or near the site include: chum salmon, cutthroat trout, coho salmon, steelhead, sockeye salmon, pink salmon, and Dolly Varden trout.

There are freshwater forested/shrub wetlands, and freshwater emergent wetlands on the proposed site. Vegetation types found in the treatment area include deciduous trees such as alder, maple, and aspen; evergreen trees; shrubs; grass; wet soil plants such as cattail, buttercup, bulrush, and skunk cabbage; and, water plants including water lily, eel grass and milfoil.

Capitol Hill (King County)

Human Health

The Capitol Hill treatment area is 130 acres in size and located in the Madison area of Seattle in a hilly area. It is a densely populated residential district, and is comprised primarily of residential housing, commercial properties, health care facilities, and parks, including Seven Hills Park and Pendleton Miller Playfield.

Ecological/Environmental Resources

There are no waterbodies or wetlands within the treatment area. Lake Washington is approximately 1.0 mile east of the proposed treatment zone. There are no agricultural or forest lands near the treatment area. There are no high quality native ecosystems in the vicinity of this treatment area.

Gig Harbor (Pierce County)

Human Health

This 600-acre treatment site is located in the East Gig Harbor area of Pierce County. It is comprised of residential and commercial areas. One church occurs in the area. No schools or hospitals occur in the treatment area.

Ecological/Environmental Resources

Crescent Creek runs north to south through the proposed site, and flows into Gig Harbor on the south end. There are also unnamed seasonal streams that run into Crescent Creek. Colvos Passage, part of Puget Sound, ranges from approximately 0.25 to 0.70 miles away from the east boundary of the treatment area.

A purple martin breeding is area approximately .4 miles southwest of the proposed treatment area. Great blue heron feeding areas occur near the eastern boundary of the area. Fish species present in Crescent Creek include: chum salmon, Chinook salmon, coho salmon, steelhead, and cutthroat trout.

Vegetation types found in the treatment area include deciduous trees such as alder, maple, and aspen; evergreen trees; shrubs; grass; wet soil plants such as cattail, buttercup, bulrush, and skunk cabbage; and, water plants including water lily, eel grass and milfoil.

V. Environmental Impacts of the Proposed Action and Alternatives

There are potential environmental consequences from both alternatives being considered. The risks associated with ecological and human impacts are examined under both alternatives.

A. No Action

Selection of the no action alternative would likely result in the establishment of AGM and EGM populations in King, Pierce, Thurston, and Clark Counties, which could lead to commensurate damage to trees relative to the level of infestation. The no action alternative would allow gypsy moths to establish in the existing areas, and continue to spread into surrounding areas. With the establishment of gypsy moths, especially AGM, the environmental concerns discussed below would likely occur. The ecological and human health effects associated with gypsy moths were examined in the 1995 final EIS and the 2012 supplemental EIS for gypsy moth management in the United States (USDA, 1995; USDA, 2012). This EA incorporates the EIS evaluation by reference and the material discussed in both of the EIS documents. The ecological and human health effects are summarized below from the EIS, as well as any new information.

1. Gypsy Moth

a. Ecological Impact

Most of the environmental impacts associated with gypsy moths are caused by the larval stage. This stage is the feeding stage which can lead to changes in forest stand composition (USDA, 1995). In areas where gypsy moth populations are high, trees can be defoliated, leading to stress (USDA, 1995). Trees that are stressed are more susceptible to diseases and other plant pests (USDA, 1995). In circumstances where high populations are sustained over several years, gypsy moth feeding damage can cause tree mortality (USDA, 1995). Gypsy moth-related defoliation of trees can also result in negative impacts to native Lepidoptera (Manderino et al., 2014). The areas of infestation,

as well as surrounding areas, contain many host trees that would be threatened by gypsy moth defoliation. Larval feeding can lead to changes in forest stand composition and nesting sites, and cover for birds and other animals could be reduced (USDA, 1995). If gypsy moths were to spread to other areas, changes in water quality and effects to aquatic organisms could occur (USDA, 1995). The loss of vegetation in the affected areas could lead to increased erosion of soil and loss of moisture retention (USDA, 1995).

b. Human Impact

In addition to these effects, some people have been shown to be allergic to the tiny hairs on gypsy moth caterpillars. These people could suffer minor allergic reactions (primarily rashes) if gypsy moths were allowed to become established. Also, irritation to eyes and throat are common reactions with increased gypsy moth infestations (USDA, 1995). In heavily infested areas, large numbers of caterpillars limit enjoyment of the outdoors for some people due to gypsy moth larval droppings and defoliation (USDA, 1995).

B. Proposed Action

The preferred action alternative is the aerial application of Btk and placement of pheromone-baited traps. Potential impacts to human health and the environment are discussed below.

1. Btk

Bacillus thuringiensis var *kurstaki*, or Btk, is a naturally occurring bacterium that has selective insecticidal activity against certain butterflies and moths. The *Bacillus* bacterium is a large group of bacteria that occurs naturally in soil, water, air, plants, and wildlife. 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 and has been the preferred material for gypsy moth eradication programs in the United States for several decades. 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.

Btk is available in several formulations, depending on its use. The formulation proposed for use in this program is Foray® 48B which is a commonly used formulation for control of lepidopteran pests. Additionally, Foray® 48B is Organic Materials Review Institute listed as a Certified Organic product. Three to five aerial applications of Foray® 48B, 3- to 14-days apart, will be made at a rate of 64 to 107 fluid ounces of product per acre. The lower rate is typically used however rates of application vary based

on the life stage of gypsy moth found and the level of infestation. The program uses the lowest rate possible that will still ensure adequate control of AGM and EGM.

a. Ecological Impact

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 (EPA, 1998; WHO, 1999; USDA, 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, 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, 2004). Bird populations that may occur in the proposed treatment areas are not expected to be impacted by the loss of prey items. Bird species expected in these areas have shown no indirect effects based on Btk applications over larger areas. In addition, the potential treatment areas are relatively small compared to the foraging areas that birds may use. Finally, 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 with the exception of lepidopteran larvae, with early instars more sensitive than later instars. Within the lepidopteran group, sensitivities can be highly variable (Peacock et al., 1998). 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 honey bees, as well as other beneficial insects (USDA, 2004). Effects to honey bees, in particular, 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 (EPA, 1998; Sterk et al., 2002; Bailey et al., 2005; Duan et al., 2008). These studies evaluated impacts to larval and adult honey bees from oral or contact exposures with no lethal or sub-lethal impacts noted at concentrations above those expected from the proposed use pattern for Btk in this program. Some nontarget Lepidoptera larvae (caterpillars) present in the proposed spray areas would likely be killed by the application of Btk. However, depressions in caterpillar populations are expected to be temporary due to recolonization from adjacent untreated areas. No threatened or endangered lepidopteran species are expected to be present in the treatment sites based on information from the U.S. Fish and Wildlife Service.

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. Water bodies, such as the Green River and Crescent and McAllister/Medicine Creeks, are located within the proposed treatment areas; however, impacts to these aquatic resources, and others in the area, are not anticipated due to label restrictions and lack of risk to aquatic resources. Multiple freshwater and saltwater fish species were tested in the laboratory to determine what level of Btk exposure would result in any effect (USDA, 2004). The levels required to produce an effect were much higher than any potential off-site residues that would occur as a result of this program (USDA, 2004). There have been laboratory studies supported by field data which suggest that exposure could result in minimal effects to aquatic invertebrates at environmental concentrations above expected values in this program (Richardson and Perrin, 1994; Kreutzweiser et al., 1992; USDA, 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, 2004). Therefore, it is unlikely that fish and other aquatic organisms will be negatively impacted by the use of Btk in the proposed gypsy moth eradication program.

After application, exposure to light, higher temperatures, and moisture decrease the amount of Btk remaining in the environment. In a summary of studies regarding the environmental fate of Btk, the majority of studies indicated 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, 1995). Btk's persistence in water depends on organic matter, content, and salinity (USDA, 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, 1995). Variations in environmental fate are attributable to various factors, including environmental conditions, formulation chemistry, study protocols, and sampling substrates.

b. Human Impact

Based on the extensive use of Btk and its long historical use in these types of programs, a large amount of mammalian toxicity data exists, as well as information from surveillance programs in previously conducted treatments. Available acute laboratory toxicity data with Btk and its various formulations demonstrate low acute mammalian oral, dermal, and inhalation toxicity and pathogenicity (McClintock et al., 1995; EPA, 1998, WHO, 1999; Siegel, 2001; USDA, 2004). The material safety data sheet (MSDS) of Foray® 48B, states that the formulated material can be a transient mild eye and skin irritant and is considered practically non-toxic in oral, dermal and inhalation

exposures (Valent, 2011). The information in the Material Safety Data Sheet applies to workers handling larger quantities of the concentrated material compared to the reduced potential exposure from material applied during application which will be diluted in water. Previously conducted human health risk assessments, which compare potential exposure data from similar applications to those proposed in this program, have demonstrated wide margins of safety with potential exposure values to the general public ranging from 28,000 to 4 million times below levels where effects were observed in laboratory studies (EPA, 1998; USDA, 2004).

Concerns have been raised regarding the pathogenicity of Btk and, in particular, 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*, which has been 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 (EPA, 1998; CDC, 2006).

Btk has been shown to produce low levels of enterotoxin in cultures; however, no reported foodborne illness cases linked to Btk exist in more than 45 years of extensive use. The lack of pathogenicity may be related to the relatively low levels of 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 the conditions of the fermentation process. 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 (EPA, 1998; USDA, 2004; Wilcks et al., 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 factors other than the presence of enterotoxin are required to cause symptoms similar to those in *B. cereus* (Federici and Siegel, 2008). Immune response and infectivity data for Btk, as well as results from surveillance studies, suggest that immune-related adverse effects in the general public are unlikely (USDA, 2004; Federici and Siegel, 2008).

Several epidemiology studies have been published based on surveillance data from applications similar to those proposed in this program 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 asthmatics (Aer'Aqua Medicine, 2001; Siegel, 2001; Noble, et al., 1992; Pearce et al., 2002; Parks Canada, 2003; USDA, 2004; Otvos et al., 2005).

One of the larger monitoring studies conducted in association with forestry Btk applications was in New Zealand (Aer'Aqua Medicine, 2001). Applications to an area containing approximately 88,000 residents were monitored using self-reporting of adverse effects, as well as information from participating physicians. Results from the study demonstrated no Btk-related cases of anaphylaxis, incidences of birth defects, or changes in birth weight, meningococcal disease, or infections. Adverse effects that were self-reported during the study were related to dermal, respiratory, and eye irritation.

Petrie et al. (2003) conducted a study to investigate the impacts of an aerial application of Foray® 48B on self-reported symptom complaints and visits to health care providers after applications in West Auckland, in 1999, to control the painted apple moth. A group of 292 residents within the spray area were questioned prior to treatment, with only 192 residents (or 62 percent) responding after treatment. The authors of the paper assessed the frequency of 25 potential health problems before and after treatment. Of these 25 symptoms, including sleep problems, dizziness, difficulty concentrating, irritated throat, itchy nose, diarrhea, stomach discomfort, and gas discomfort, 8 were found to have increased after application. These results are similar to those reported from the same area by an advocacy group opposed to the spray (Blackmore, 2003; Goven et al., 2007). Petrie et al. (2003) states that sleep problems, dizziness, and difficulty concentrating may be related to anxiety regarding perceptions about the risk of the program. A significant increase in participants with hay fever symptoms was noted; however, this may be incidental, as the authors point out, because the onset of the pollen season could have influenced reporting. The authors attribute the gastrointestinal symptoms to possible enterotoxin production from the microbial insecticide; however, this possibility is not supported by any available literature, and no other additional information is offered. The authors do not discuss the possibility that the gastrointestinal symptoms may be related to the reported anxiety from the perceived risks of the application. In addition, the statistical comparisons that were utilized in the study are not considered appropriate for the multiple comparisons that were made (Federici and Siegel, 2008; USDA, 2004). A review of the study and the application of conservative statistical analysis more appropriate for multiple comparisons revealed that none of the endpoints were found to be statistically significant (USDA, 2004). The authors point out that the results should be interpreted with caution as only slightly more than half of the original residents responded post-application through self- reporting which could bias the results. It is important to note that there was no increase in the frequency of visits to general practitioners or other health care providers after treatment which is consistent with results from other surveillance studies of Btk applications.

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

Mild irritation of the eyes, skin, and respiratory tract may be associated with exposures to Btk; however, this is more likely to occur to applicators who are handling the concentrated material. Risks to applicators will be minimized as long as Foray® 48B is handled according to label requirements. Public open houses as well as additional public outreach and education will continue with local citizens, as well as the local health departments and local hospitals and clinics closer to the time of treatments.

c. Summary

Human health risks are expected to be minimal from Btk applications in this program, based on its long-term safety which has been demonstrated through laboratory and monitoring studies. The potential for exposure is greatest to workers who handle the concentrated product; however, exposure will be minimized by following label requirements. A continuation of local outreach and education will minimize anxiety and health concerns associated with these treatments.

There will be minimal risk to most nontarget terrestrial and aquatic organisms due to limited exposure and low toxicity. Impacts to some native lepidopteran larvae within the spray areas may occur; however, the effects are expected to be minor due to the size of the treatment areas and specificity of Btk to the larval stage of the insect. Label requirements and other restrictions, where appropriate, will further reduce risk to sensitive organisms, such as some aquatic invertebrates and pollinator species as described above.

2. Trapping

Trapping will involve disparlure/pheromone-baited traps to attract male gypsy moths. Disparlure is the common name for cis-7,8-epoxy-2-methyloctadecane, a synthetically produced sex pheromone of the natural pheromone that is used by the female gypsy moth to attract the male gypsy moth. The environmental impacts and human impacts are summarized below.

a. Ecological Impact

In acute toxicity tests, disparlure was not toxic to mammals, birds, or fish (USDA, 2006). Disparlure does exhibit some toxicity to aquatic invertebrates; however, the effects are related to study design and the limited solubility of the pheromone (USDA, 2006). Studies using cladocerans revealed toxicity was related to the organisms becoming physically trapped at the water surface where undissolved pheromone was present (USDA, 2006). Risks to aquatic organisms are not expected in this program because all pheromone will be placed in sticky traps, thus eliminating any potential offsite run-off or drift. Pheromone traps do catch small numbers of nontarget organisms that accidently fly or crawl into the traps. However, because the pheromone in the trap is specific to gypsy moths, nontarget insects will not be attracted to traps, the number of nontarget organisms affected will be very small, and the pheromone will have minimal impacts to the environment.

b. Human Impact

Disparlure belongs to a group of compounds known as straight-chain lepidopteran pheromones. Acute toxicity studies with this group of compounds have shown very low mammalian toxicity through multiple exposure routes. The lack of toxicity with these types of compounds has resulted in reduced data requirements for their registration by the U.S. Environmental Protection Agency (EPA) (EPA, 2004). Subchronic and chronic studies are limited for these types of chemicals; however, given the low acute toxicity and the fact that 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 sticky traps and the limited amount used in the proposed program) substantially reduces the potential for exposure and risk. The pheromone can be persistent on individuals who come into physical contact with disparlure; if this were to occur, the individuals may attract adult male moths for prolonged periods of time (up to 2 to 3 years) (USDA, 2006). No toxic effects are expected but it may be a considerable nuisance in gypsy moth-infested areas, such as the eastern United States (USDA, 2006). The level of exposure required to cause the attractant effect cannot be characterized, although the likelihood of the effect is much greater for workers than for the general public.

Nevertheless, physical contact with disparlure from trapping is unlikely, and would only occur if someone were to tamper with the traps.

c. Summary

Human health risks are expected to be minimal from using disparlure baited traps in this program based on disparlure's long-term safety and the fact that it would be unlikely that humans would come into contact with disparlure in the traps. The potential for exposure is greatest to workers who handle the concentrated product; however, exposure will be minimized by following label requirements. A continuation of local outreach and education will minimize anxiety and health concerns associated with these treatments.

There will be minimal risk to most nontarget terrestrial and aquatic organisms due to limited exposure and low toxicity. The traps themselves are baited with pheromone specific to gypsy moth. There may be incidental captures of nontarget insects that enter the trap by mistake; however, the number of affected would be very small.

VI. Other Issues

A. Cumulative Impacts

The proposed gypsy moth eradication program has limited impacts to lepidopteran and other nontarget species in the affected areas. These limited impacts are not expected to have a cumulative impact with past, present, or future projects in these areas. Based on the analysis in the environmental impacts section, there are greater potential impacts to the environment with the use of Btk versus trapping. Btk primarily impacts lepidopterans and also species that may rely on lepidopterans as a primary source of food.

Btk has other uses including organic and non-organic crop protection, and home and garden uses. The amount of Btk currently used in the treatment area is unknown; however, there would be an expected increase in environmental loading of Btk with the proposed treatments. The increase in environmental loading from the proposed Btk applications will be transient because applications will occur over a relatively short period of time. The cumulative impacts from additional Btk use, relative to other stressors is expected to be incrementally negligible to human health and the environment due to the low risk of Btk. Cumulative impact potential is greatest for native Lepidoptera in the treatment block that may be sensitive to Btk applications; however, these impacts are expected to be minor because they would be localized and transient compared to the cumulative impacts that could result from the establishment of gypsy moths.

Cumulative impacts from the no action alternative would be expected to be greater than those from the preferred alternative because not treating would allow gypsy moths to become established and spread to other areas within Washington, Oregon, and other uninfested areas of the United States. As previously mentioned, both the AGM and EGM have wide host ranges and damage to host plants would be expected in the event that these gypsy moths are allowed to become established. The effects of natural and manmade stressors to forests (e.g., timber harvests, acid rain, climate change, and other pests and diseases) can be additive or synergistic, that is, the effects of all of the stressors together become greater than the individual stressors alone (Cox, 1999; Logan et al., 2003). The addition of gypsy moth defoliation to forested areas that are already under stress would be expected to result in cumulative economic and environmental impacts (USDA, 2012). In addition, new areas where gypsy moths become established would be subjected to non-program insecticide applications. Risk to human health and the environment may be increased with these applications because many insecticides are registered for use to control gypsy moths and may have a greater risk compared to Btk (USDA, 2012).

In the event that the AGM or EGM populations are not eradicated from Washington by the proposed gypsy moth eradication program, future treatments may be required. Treatment with Btk in the same areas over several years may lead to an increase in effects to lepidopteran species, thus limiting their chances to reestablish in the proposed treatment area. However, if future treatments are needed, a subsequent EA will be conducted and risks will be evaluated further.

B. Threatened and Endangered Species

Section 7 of the Endangered Species Act (ESA) and ESA's implementing regulations require Federal agencies to ensure that 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 and critical habitat in King, Pierce, Thurston, and Clark Counties.

APHIS prepared a biological assessment (BA) that determined that the proposed gypsy moth program will have no effect on listed species and critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service (FWS) that are within the treatment areas. APHIS submitted the BA to FWS, and also met with FWS personnel on February 3, 2016 to discuss potential effects to listed species and critical habitat in the treatment areas. FWS indicated that no effect determinations were appropriate. APHIS also prepared a BA that the proposed gypsy moth program is not likely to adversely affect federally listed species managed by the National Marine Fisheries Service (NMFS), including Chinook, chum, sockeye, and coho salmon, Pacific eulachon, and North American green sturgeon. APHIS submitted the BA to NMFS requesting concurrence on its

determinations that the program is not likely to affect listed species or designated critical habitat.

C. Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. 668–668c) prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle…[or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

APHIS contacted the FWS Pacific Regional Bald Eagle Coordinator to determine if any bald eagle nests may occur in the proposed treatment area. Nest location information within the proposed treatment blocks was provided to APHIS using a Washington Department of Fish and Wildlife Database located at http://wdfw.wa.gov/mapping/phs/disclaimer.html. Bald eagles are breeding at the Tacoma and Lacey treatment sites. Nest monitoring for activity will use protocols proposed by the FWS Pacific Regional Bald Eagle Coordinator (FWS, 2016). Nests that are determined to be active prior to the proposed treatments will have a 1000-foot no spray buffer applied to minimize nest disturbance. Spray buffers are based on recommendations from FWS in the National Bald Eagle Management Guideline document (FWS, 2007). APHIS is working with WSDA and the FWS Regional Bald Eagle Coordinator for a potential disturbance permit in cases where applications within the 1000-foot no spray buffer may be required due to the presence of gypsy moth host material that would require Btk applications. Btk has low toxicity to birds and would not be expected to have indirect effects to their prey items based on available toxicity data; therefore, any permits would be based on the potential for disturbance.

D. Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (16 U.S.C. 703–712) established a Federal prohibition, unless permitted by regulations, 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. FWS released a final rule on November 1, 2013, identifying 1,026 birds on the List of Migratory Birds (FWS, 2013). Species not protected by the Migratory Bird Treaty Act include nonnative species introduced to the United States or its territories by humans and native species that are not mentioned by the Canadian, Mexican, or Russian Conventions that were implemented to protect migratory birds (FWS, 2013). See Table 1 for a list of migratory birds

that may be present in the treatment areas.

Table 1. Migratory bird species present in treatment areas (FWS, 2015a;b;c;d;e;f)

Common name	Scientific name	Treatment area(s)
Black swift	*Cypseloides niger*	Kent, Nisqually/Lacey, Tacoma, Gig Harbor, Capitol Hill
Brewer's sparrow	*Spizella breweri*	Portland/Vancouver
Caspian tern	*Hydroprogne caspia*	Kent, Nisqually/Lacey, Tacoma, Gig Harbor, Capitol Hill
Fox sparrow	*Passerella iliaca*	Kent, Nisqually/ Lacey, Tacoma, Portland/Vancouver, Gig Harbor, Capitol Hill
Olive-sided flycatcher	*Contopus cooperi*	Kent, Nisqually/ Lacey, Tacoma, Portland/Vancouver, Gig Harbor, Capitol Hill
Peregrine falcon	*Falco peregrinus*	Kent, Nisqually/Lacey, Tacoma, Portland/Vancouver, Gig Harbor, Capitol Hill
Purple finch	*Carpodacus purpureus*	Kent, Nisqually/Lacey, Tacoma, Portland/Vancouver, Gig Harbor, Capitol Hill
Rufous hummingbird	*Selasphorus rufus*	Kent, Nisqually/Lacey, Tacoma, Portland/Vancouver, Gig Harbor, Capitol Hill
Short-billed dowitcher	*Limnodromus griseus*	Kent, Nisqually/Lacey, Tacoma, Gig Harbor, Capitol Hill
Short-eared owl	*Asio flammeus*	Kent, Nisqually/Lacey, Tacoma, Portland/Vancouver, Gig Harbor, Capitol Hill
Vesper sparrow	*Pooecetes gramineus* ssp. *affinis*	Nisqually/Lacey, Tacoma, Portland/Vancouver
Willow flycatcher	*Empidonax traillii*	Kent, Nisqually/Lacey, Tacoma, Portland/Vancouver, Gig Harbor, Capitol Hill

The proposed use of Btk is not anticipated to result in negative impacts to migratory birds due to its low toxicity to vertebrates. Impacts to nesting and foraging are also not anticipated due to the selective nature of Btk to certain lepidopteran insects. Impacts to certain lepidopteran insects that are prey items for birds may occur; however, the comparatively small areas of treatment and the general feeding habits of most migratory birds suggest that migratory bird populations would not be negatively impacted.

E. Historical Preservation

Consistent with the National Historic Preservation Act of 1966, APHIS has examined the proposed action in light of its impacts to national historical properties. See Table 2 for a list of historic properties located in the treatment areas. APHIS is coordinating with the State Historic Preservation Office to ensure that there will be no impacts to these properties from the proposed treatments.

Table 2. Historic sites within proposed gypsy moth treatment areas (Data from Washington Information System for Architectural and Archaeological Records Data (WISAARD) https://fortress.wa.gov/dahp/wisaardp3/). Accessed Jan. 29, 2016.

Historic Site Name	Address	County	City
Fire Station No. 15*	3510 East Eleventh Street	Pierce	Tacoma
M.V. Kalakala (ferry)*	Hylebos Creek Waterway, 1801 Taylor Way	Pierce	Tacoma
Property ID: 537239	3510 E. 11th Street	Pierce	Tacoma
Property ID: 530216	1114 Taylor Way	Pierce	Tacoma
Property ID: 530215	1123 Taylor Way	Pierce	Tacoma
Naval Reserve Training Center - Bldg. 35	1100 Alexander Avenue	Pierce	Tacoma
Naval Reserve Training Center - Bldg. 51	1100 Alexander Avenue	Pierce	Tacoma
Wheeler, Osgood and Company Building	East 11th St.	Pierce	Tacoma
Tacoma Municipal Railway Building	1123 Taylor Way	Pierce	Tacoma
First Methodist Protestant Church*	128 16th Avenue East	King	Seattle
Caroline Kline Galland House*	1605 17th Avenue	King	Seattle
Temple de Hirsch*	15th Avenue and East Union St.	King	Seattle
Fire Station No. 7 - Seattle	402 15th Avenue East	King	Seattle
1600 E John St. Apartments	1600 E. John St.	King	Seattle
Property ID: 456277	122 18th Avenue East	King	Seattle

*Properties on the National Register of Historic Places

F. Executive Orders

Consistent with Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," APHIS considered the potential for disproportionately high and adverse human health or environmental effects on any minority or low-income populations. The proposed treatment areas have been determined based on gypsy moth finds in the area. The proposed treatment itself will have minimal effects to those that live in this area, and will not have disproportionate effects to any minority or low-income population. WSDA has added homeless shelters in the area to its stakeholder list, and will be providing specific outreach to homeless shelters prior to treatments.

Consistent with EO 13045, "Protection of Children from Environmental Health Risks and Safety Risks," APHIS considered the potential for disproportionately high or adverse environmental health and safety risks to children. The children in the proposed treatment areas are not expected to be adversely affected disproportionately more than adults from the proposed program actions.

Executive Order 13175, "Consultation and Coordination with Indian Tribal Governments" was issued to ensure that there would be "meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications…".

During the environmental review process, APHIS determined that ceded Tribal lands exist within the proposed treatment areas (Nisqually Indian Tribe; Puyallup Tribe Indians of the Puyallup Reservation; Squaxin Island Tribe of the Squaxin Island Reservation; and Suquamish Indian Tribe of the Port Madison Reservation).

In addition, the Puyallup Reservation is located in the Tacoma treatment area. The Nisqually Reservation is located directly adjacent to the Nisqually treatment area. The Muckleshoot Indian Tribe is 6 miles from the Tacoma treatment areas. The Suquamish Indian Tribe of the Port Madison Indian Reservation lands are located 20 miles from the Capitol Hill treatment area.

APHIS has determined that the proposed action will not disturb the ground and will not permanently alter views or landscape, nor is the proposed action likely to cause disproportionate adverse effects to Tribal members in comparison to other individuals in the treatment area. For these reasons, APHIS does not expect any Tribal members to be directly affected by program activities.

On February 1, 2016, APHIS sent a letter to notify the Tribes of the proposed eradication program, to request information in case APHIS overlooked ways that Tribes may be affected by the program, and to invite Tribes to meet in person with APHIS and WSDA decisionmakers should they request it

VII. Listing of Agencies and Persons Consulted

National Marine Fisheries Service
510 Desmond Drive SE, Suite 103
Lacey, WA 9853

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection and Quarantine
Plant Health Programs
4700 River Road, Unit 134
Riverdale, MD 20737

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection and Quarantine
33400 9th Avenue S., Suite 200
Federal Way, WA 98003

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

U.S. Fish and Wildlife Service
510 Desmond Drive SE
Lacey, WA 9853

Washington State Department of Agriculture
Natural Resources Building
P.O. Box 42560
1111 Washington St. SE
Olympia, WA 98504-2560

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WSDE—See Washington State Department of Ecology

Appendix 1. Maps of Treatment Area

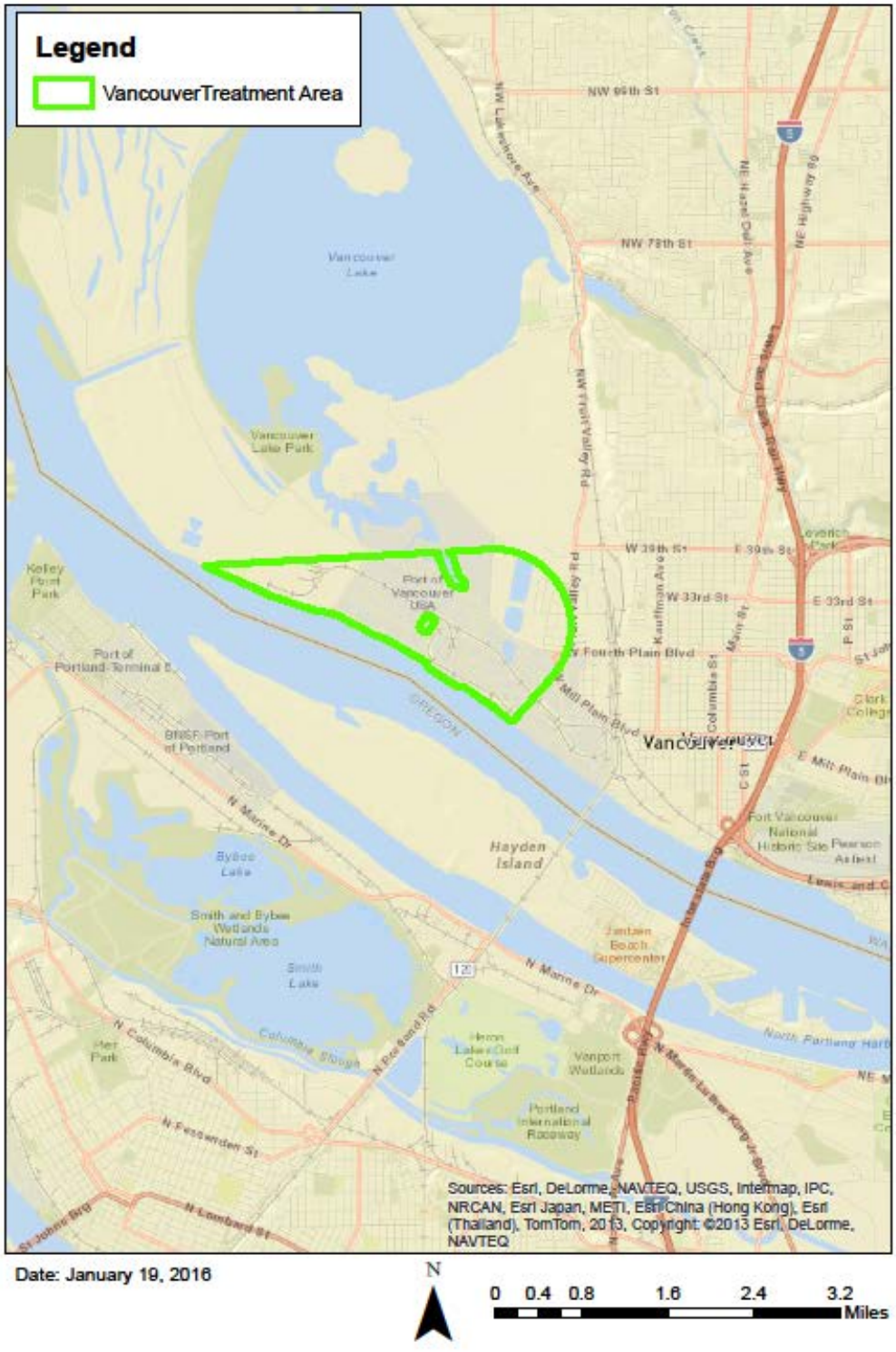

Figure 1. Map of proposed Vancouver treatment area.

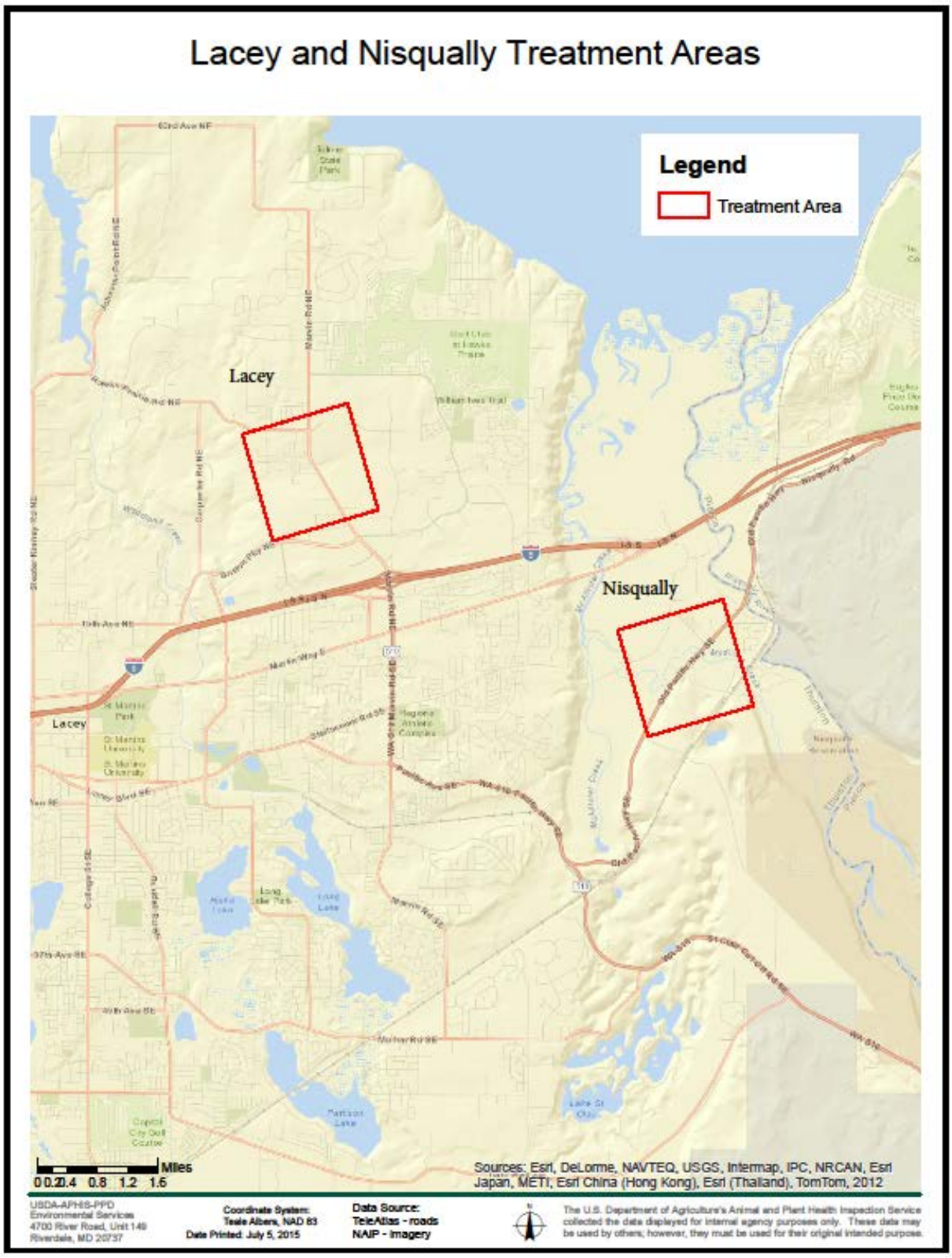

Figure 2. Map of proposed Nisqually and Lacey treatment areas.

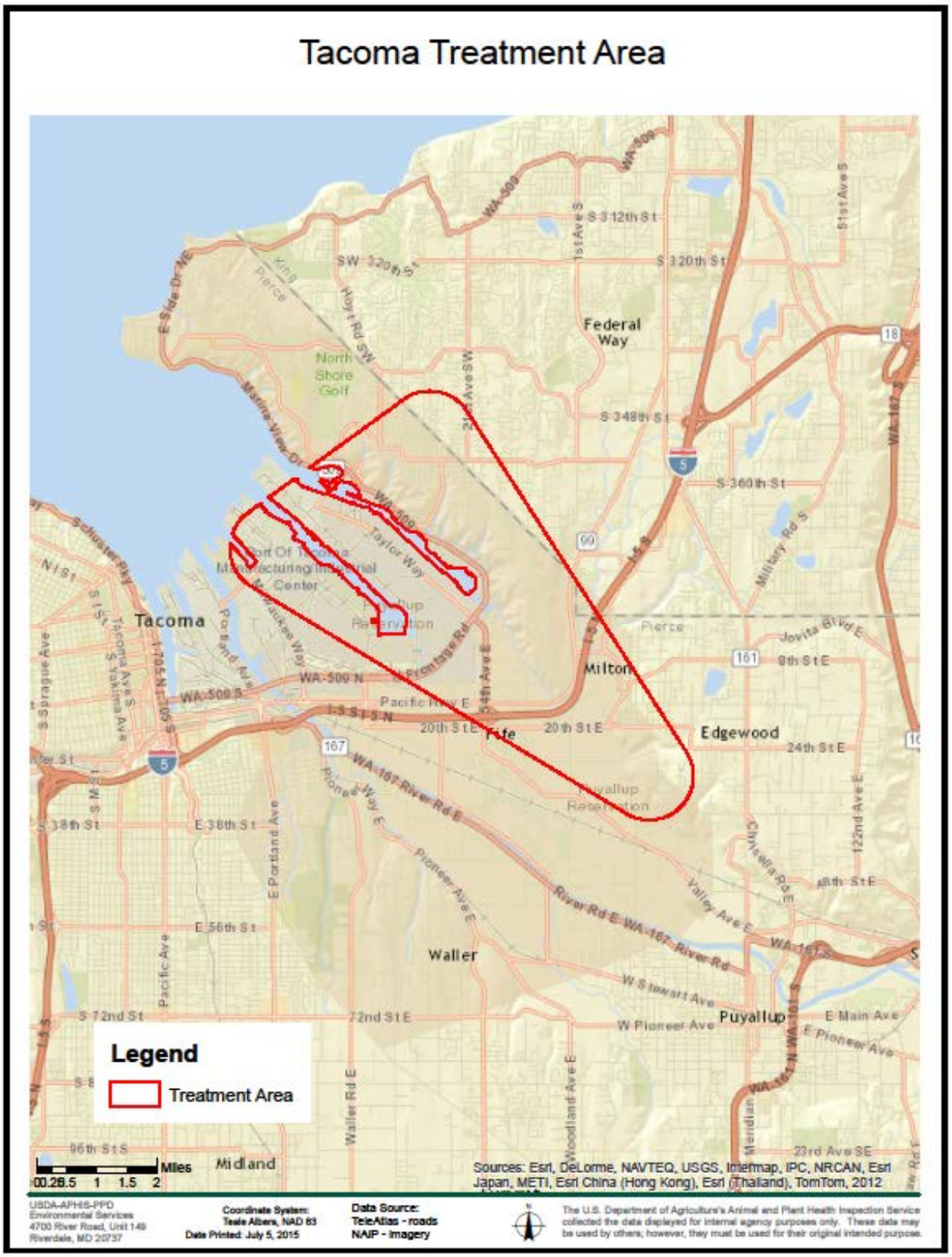

Figure 3. Map of proposed Tacoma treatment area.

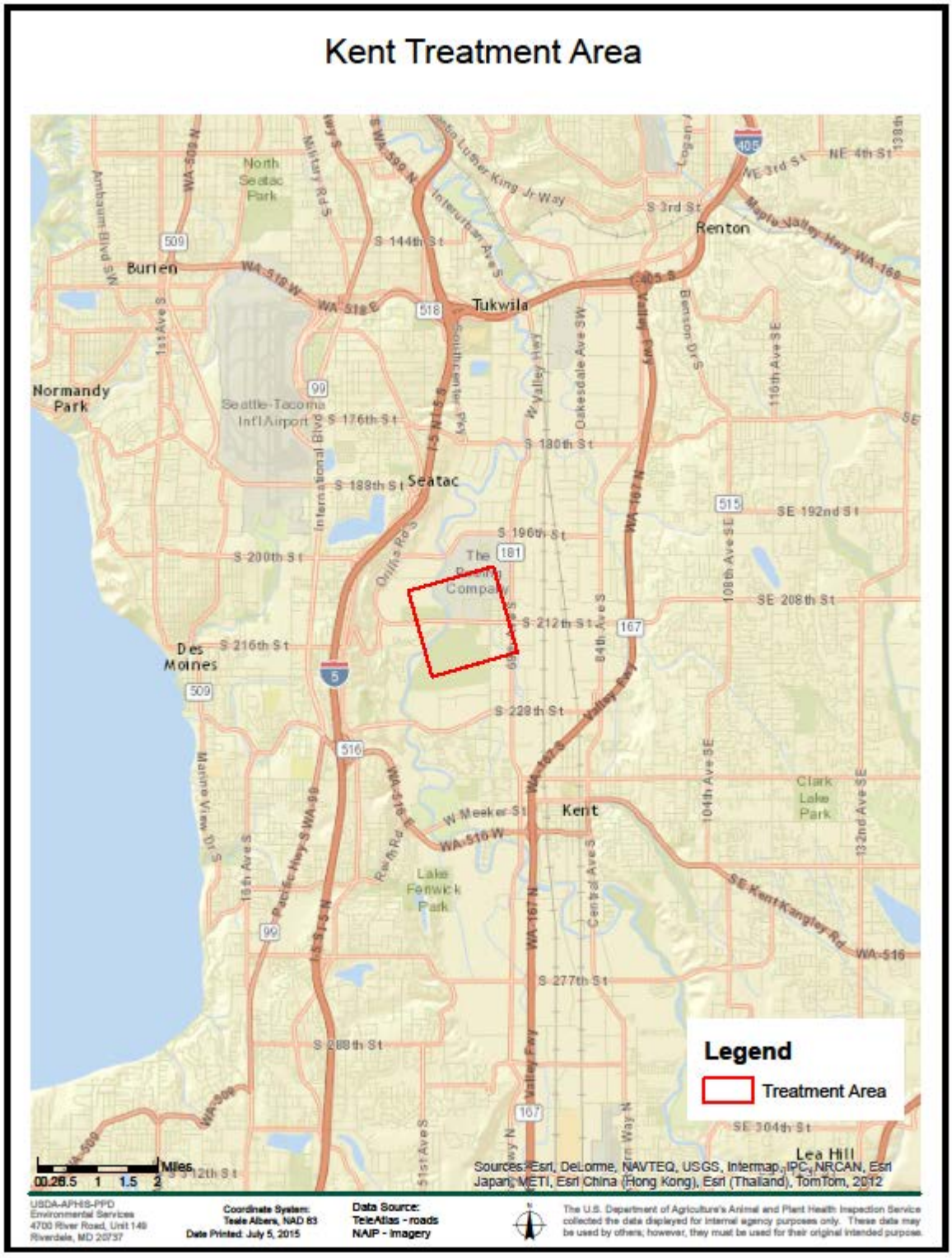

Figure 4. Map of proposed Kent treatment area.

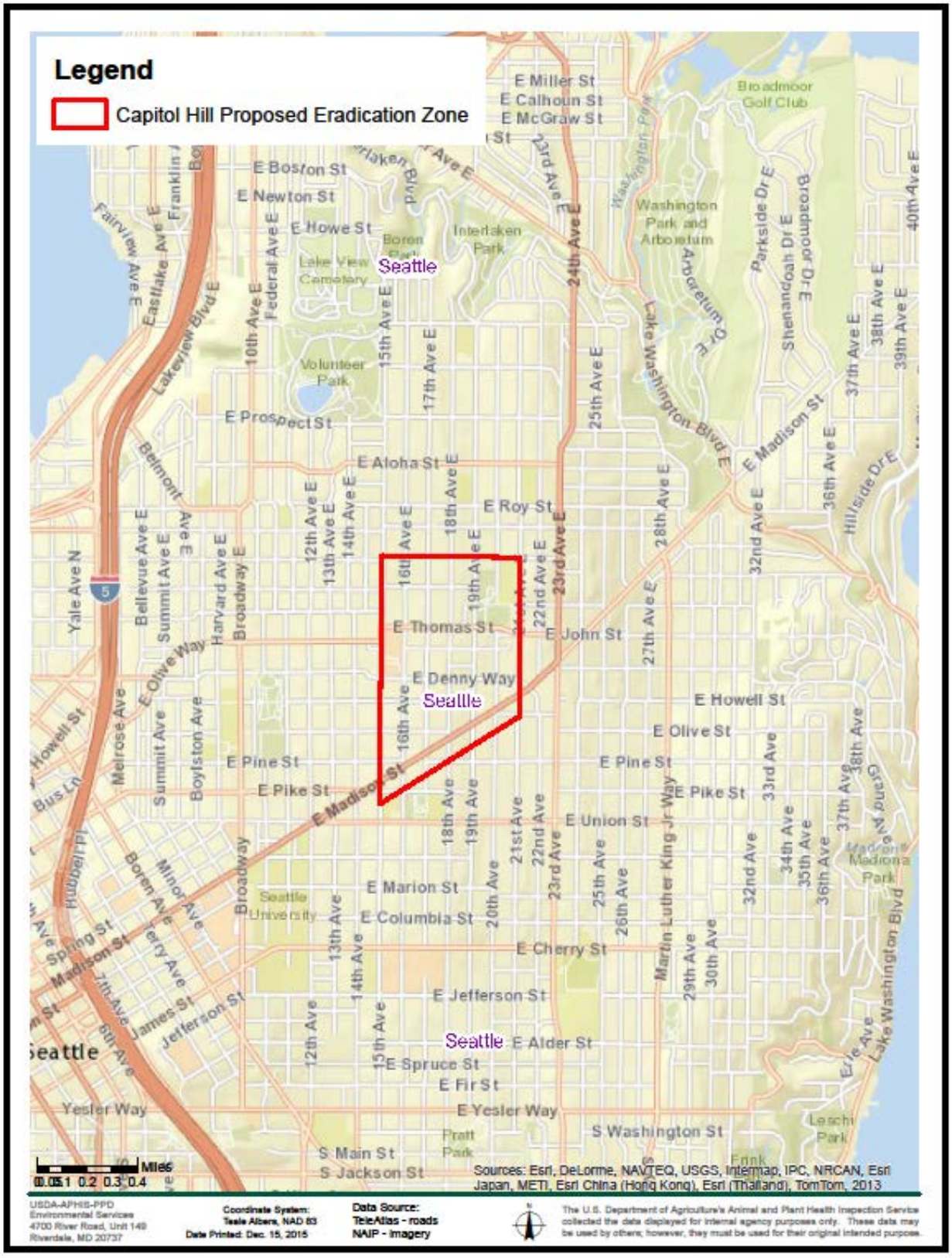

Figure 5. Map of proposed Capitol Hill treatment area.

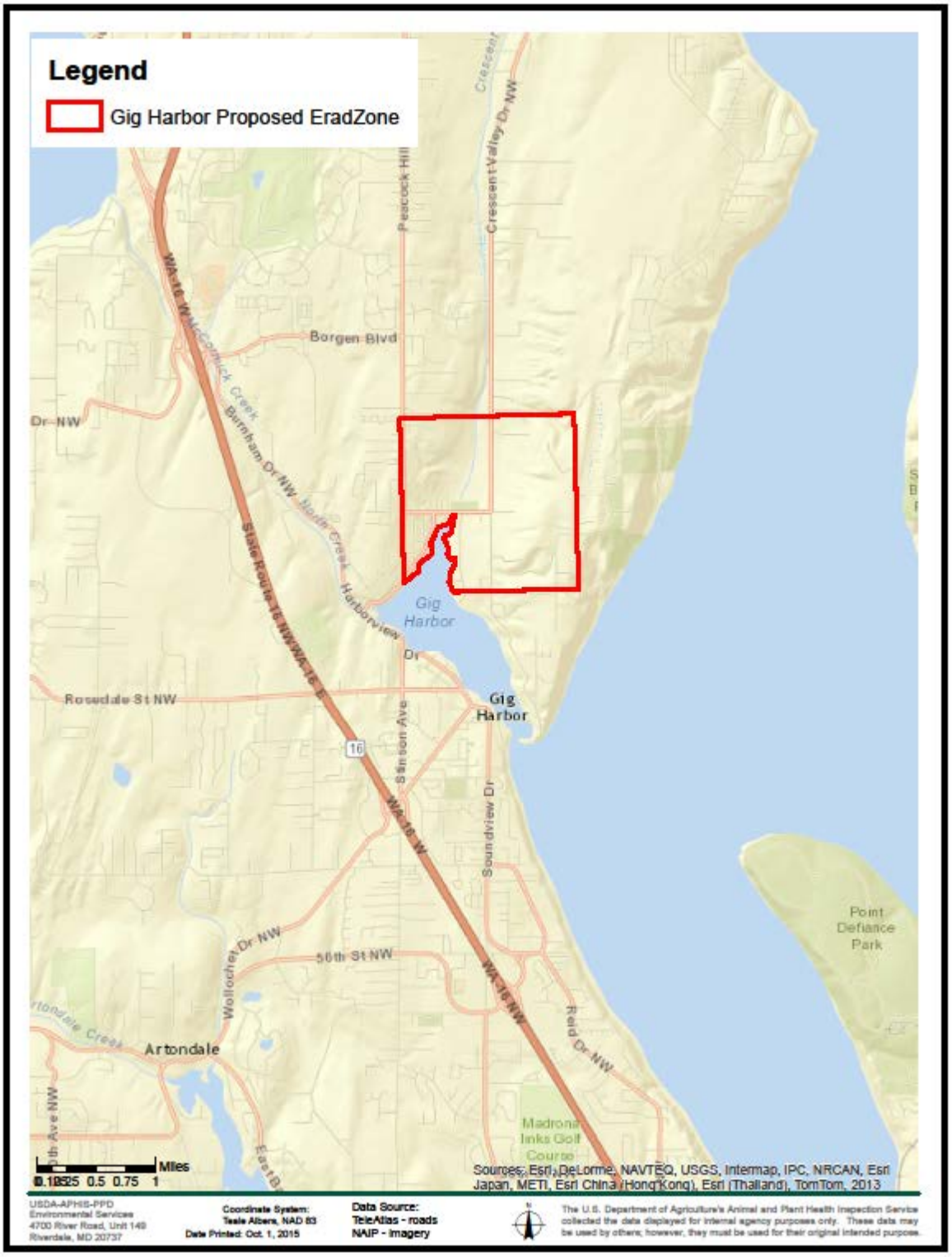

Figure 6. Map of proposed Gig Harbor treatment area.