5.4.4 INFESTATION

This section provides a profile and vulnerability assessment for the infestation hazard.

5.4.4.1 Hazard Profile

This section provides profile information including description, location and extent, previous occurrences and losses and the probability of future occurrences.

Description

An infestation is defined as a state of being invaded or overrun by parasites that attack plants, animals and humans. Insect, fungi and parasitic infestations can result in destruction of various natural habitats and cropland, impact human health, and cause disease and death among native plant, wildlife and livestock. An infestation is the presence of a large number of pest organisms in an area or field, on the surface of a host, or in soil. They result from when an area is inhabited or overrun by these pest organisms, in numbers or quantities large enough to be harmful, threatening or obnoxious to native plants, animals and humans. Pests are any organism (insects, mammals, birds, parasite/pathogen, fungi, non-native species) that are a threat to other living species in its surrounding environment. Pests compete for natural resources or they can transmit diseases to humans, crops and livestock. Human populations are generally impacted by insect or animal infestations that can result in health impacts and can lead to potential epidemics or endemics.

New York State has been impacted by various past and present infestations including: high population of mosquitoes (West Nile Virus); deer ticks (Lyme disease); Asian longhorned beetles; and hemlock woolly adelgid. Other infestations that have impacted the State include: Eastern Equine Encephalitis, La Crosse Encephalitis, Powassan Virus, St. Louis Encephalitis, Western Equine Encephalitis, Emerald Ash Borer, and Sirex Woodwasp. Not all of these infestations have occurred in Chenango County; therefore, the following infestations listed below will further be discussed in this section.

West Nile Virus (WNV) is a mosquito-borne virus that can cause encephalitis (inflammation of the brain) or meningitis (inflammation of the lining of the brain and spinal cord). WNV is spread to humans by the bite of an infected mosquito. A mosquito becomes infected by biting a bird that carries the virus (NYS DOH, 2013).

Lyme disease is caused by the Lyme Disease Bacterium, *Borrelia burgdorferi*, which normally lives in mice, squirrels and other small animals. It is transmitted among these animals and to humans, through the bites of a certain species of ticks, particularly the deer tick. Lyme disease infections can cause symptoms affecting the skin, nervous system, heart, and/or joints of an individual (NYSDOH, 2013).

Asian Longhorned Beetles (ALB) is an exotic pest, native to parts of Asia, threatening a wide variety of hardwood trees in North America, particularly in New York State, New Jersey and Chicago. The beetle is believed to have arrived in New York City in the 1980s, in wooden packing material used in cargo shipments from China. The ALB has the ability to infest certain hardwood trees, eventually destroying them. They are a threat to public, private and commercial hardwood trees. The U.S. Department of Agriculture (USDA) believes this beetle can probably survive and reproduce in most sections of the country where suitable host trees exist.

Sirex Woodwasp is a Eurasian native, which was first discovered in New York State in 2005. This was the first North American discovery of this exotic, invasive pest that is one of the top 10 most serious forest insect pest invaders worldwide. Native woodwasps utilize dead and dying pines, whereas the invasive sirex woodwasp attack healthy pines as well. Pines, with a diameter of six inches or greater, are susceptible; however, stressed, suppressed, and crowded pines are favored by the sirex woodwasp (NYIS, 2013). All pine

species are believed to be at risk, particularly stressed Scots (or Scotch), red and eastern white pines (NYSDEC, 2013).

Emerald Ash Borer was first discovered in the U.S. in 2002 in southeastern Michigan. This Asian beetle infests and kills North American ash species, including green, white, black and blue ash; making all native ash trees susceptible to this insect. The insect are typically present from late May through early September and are most common in June and July. Signs of infection include tree canopy dieback, and yellowing and browning of leaves. Most trees die within two to four years of becoming infested. The emerald ash borer is responsible for the destruction of over 50 million ash trees in the U.S. since its discovery in Michigan.

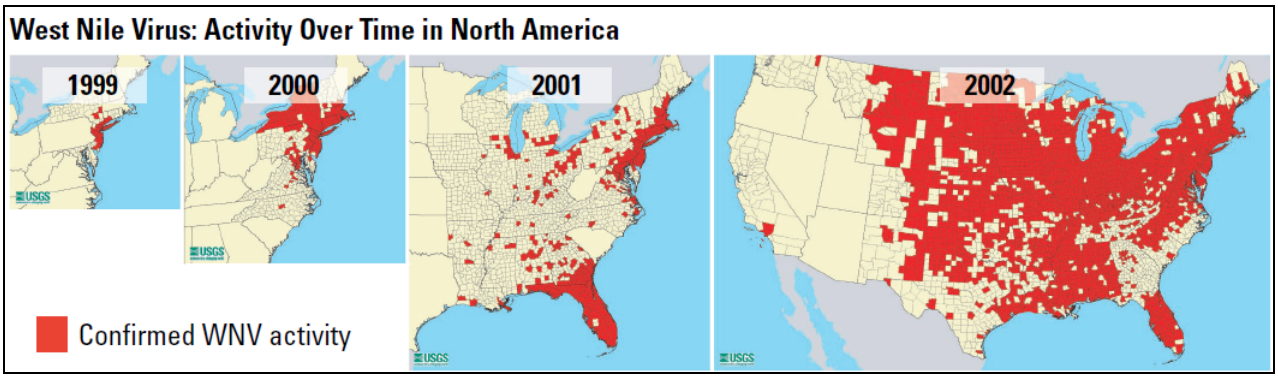
Extent and Location

The presence of disease-carrying mosquitoes and ticks has been reported throughout most of New York State and in Chenango County. Information regarding the location and extent of these pests is further discussed below.

West Nile Virus

Since it was discovered in the western hemisphere, WNV has spread rapidly across North America, affecting thousands of birds, horses and humans. WNV swept from the New York City region in 1999 to almost all of the continental U.S., seven Canadian provinces and throughout Mexico and parts of the Caribbean by 2004 (USGS, 2003). Figure 5.4.4-1 shows the activity of WNV over time in North America, from 1999 to 2002.

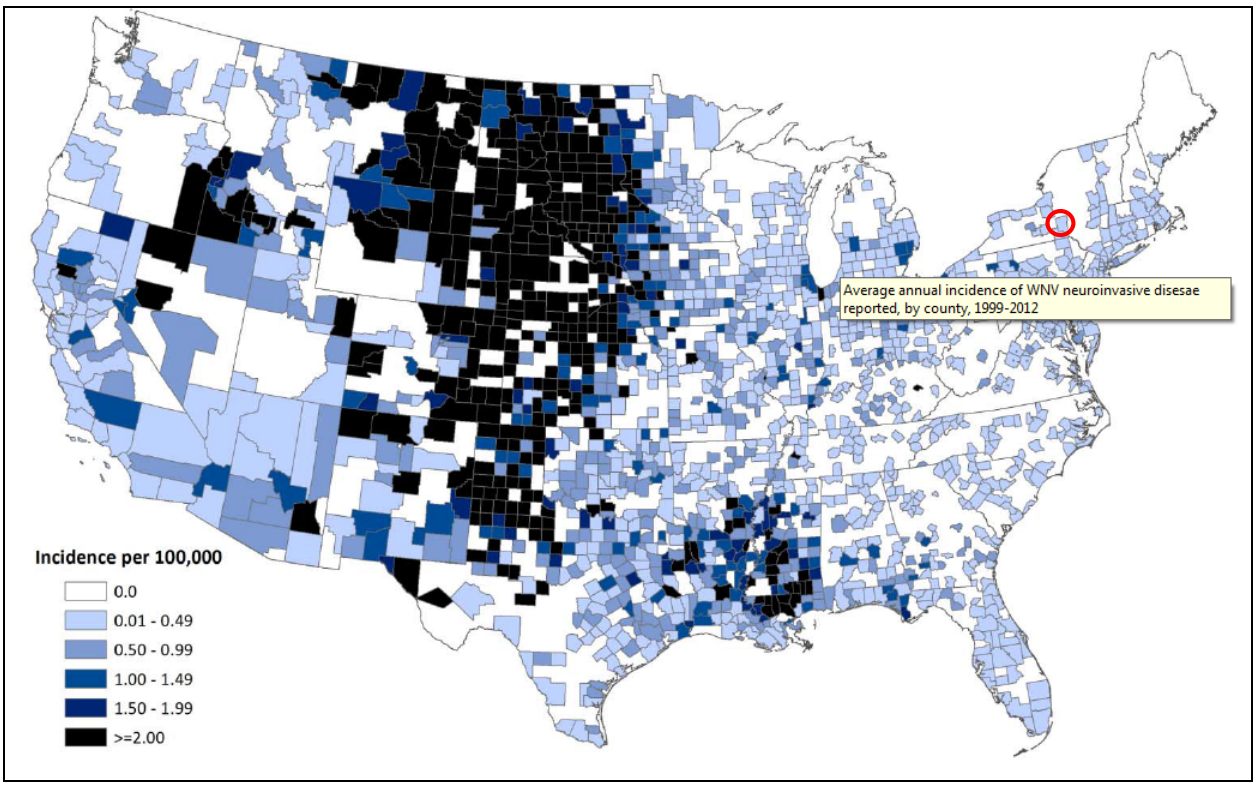
Figure 5.4.4-1. WNV Activity Over Time in North America



Source: USGS, 2003

The CDC has a surveillance program for WNV. Data is collected on a weekly basis and reported for five categories: wild birds, sentinel chicken flocks, human cases, veterinary cases and mosquito surveillance (CDC, 2013). Figure 5.4.4-2 illustrates WNV activity in the U.S. for 1999-2012.

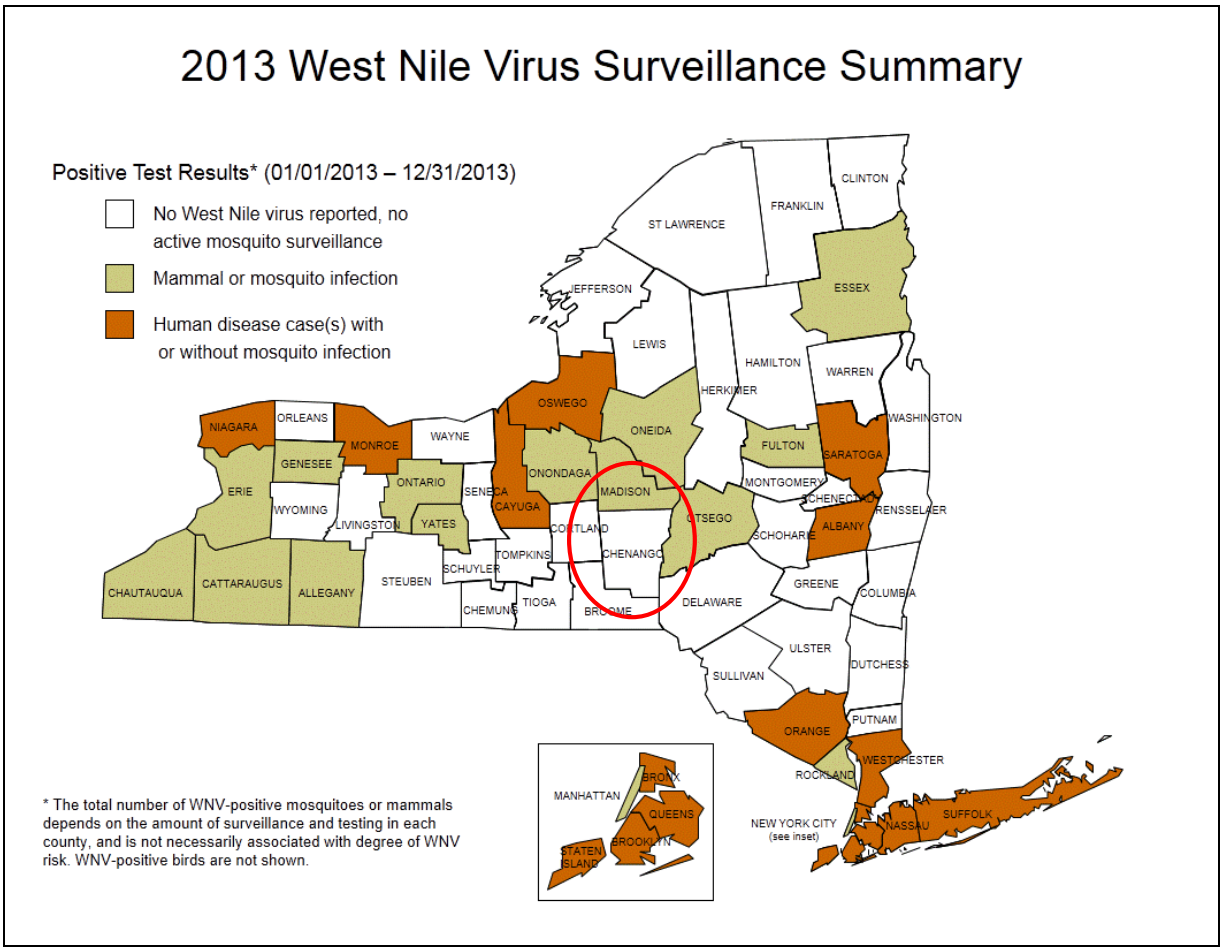
Figure 5.4.4-2. Average annual incident of WNV neuroinvasive disease reported to the CDC by county, 1999-2012



Note: Chenango County is circled in red.

WNV has been present in Chenango County since 2002. Based on information provided by the New York State Department of Health (NYSDOH), all of Chenango County has experienced WNV cases from 2002 to present (NYSDOH, 2013). Specific information regarding the location of the cases was not made available. Figure 5.4.4-3 illustrates the location of positive test results of WNV in New York State for 2013, through October 9. Chenango County was shown as having no reports of WNV, and no active mosquito surveillance.

Figure 5.4.4-3. 2013 West Nile Virus Surveillance Summary



Source: *NYSDOH, 2013*

Note: *The total number of WNV-positive mosquitoes/mammals depends on the amount of surveillance and testing in each county and is not necessarily associated with degree of WNV risk. This figure does not include WNV-positive birds.*

Lyme Disease

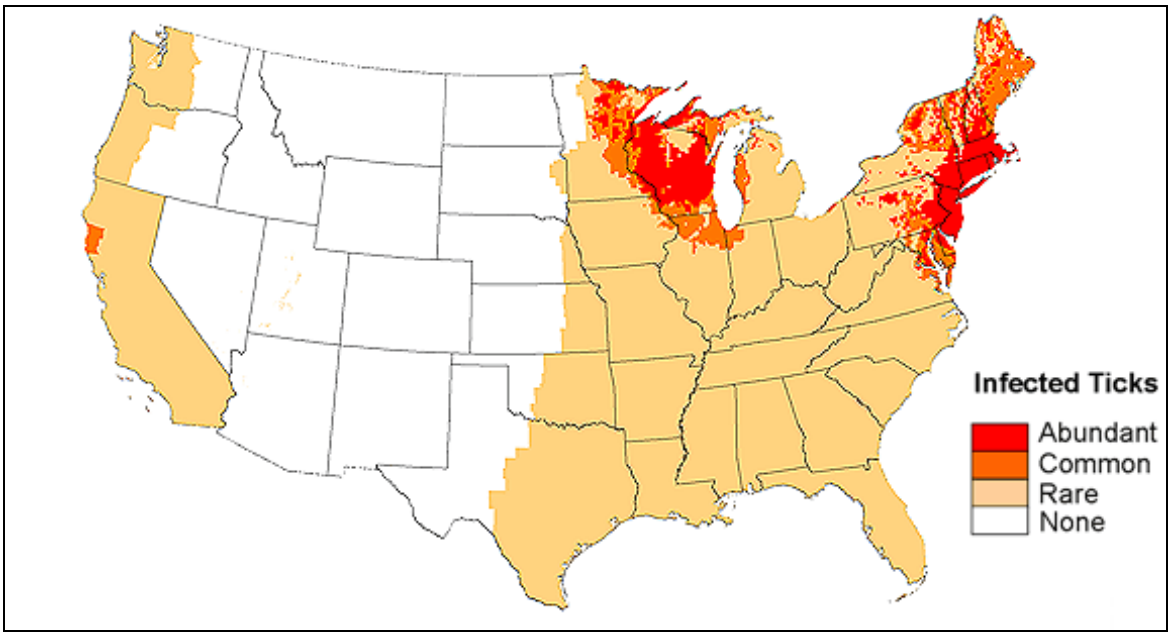
Lyme disease has a wide distribution in northern temperate regions of the world. In the U.S., the highest incidence occurs in the Northeast, from Massachusetts to Maryland and the North-central states, especially Wisconsin and Minnesota. From 2003-2012, more than 239,000 cases of Lyme disease were reported in the U.S.

The CDC Division of Vector Borne Diseases (DVBD) indicated in 2013 that New York State was the state with the second-highest number of confirmed Lyme disease cases from 2003 to 2012, totaling approximately 42,111 cases. Only Pennsylvania had a higher total, with 42,189 (CDC, 2013). As of March 2013, over 95,000 cases have been reported for New York State to the NYSDOH since Lyme disease became reportable in 1986 (NYSDOH, 2013).

The deer tick has been found in 42 counties within New York State. In infested areas, the deer tick is common wherever deer and woodland mice frequent. White-tailed deer thrive where suburban lawns adjoin woodland or open fields. Open areas provide deer grazing areas, woods offer shelter and browse (food), and residential lawns provide ornamental plantings that serve as a food source. People are increasingly establishing their home sites in wooded areas. In so doing, they create a habitat that attracts deer, mice and ticks.

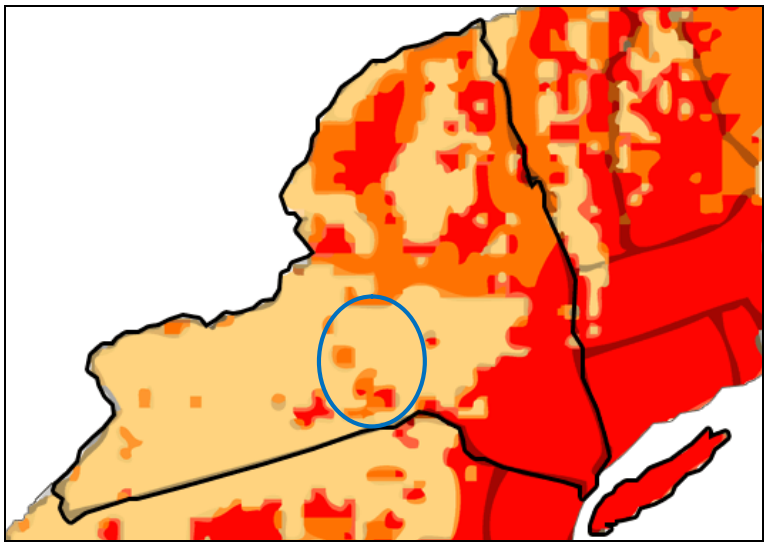
In 2006, U.S. Senator Chuck Schumer (D-NY) called for more research on the treatment and diagnosis of Lyme disease, due to its increasing prevalence. However, according to Stony Brook University Hospital doctors, it is not just Lyme disease that is caused by ticks, as these insects, also are capable of causing several other serious illnesses (Centamore, 2006).

Figure 5.4.4-4. Infected Tick Areas – U.S.



Source: American Lyme Disease Foundation, 2011
Risk Classification:
Abundant: *High density of host-seeking nymphal* I.scapularis *ticks.*
Common: *Medium density of host-seeking nymphal* I.scapularis *ticks or where at least 2% of* I. pacificus *ticks have been shown to be infected with* B. burgdorferi.
Rare: *Areas where* I. scapularis *or* I. pacificus *ticks have been reported, but host-seeking nymphs are extremely rare (*I. scapularis*) or infection prevalence is low (*I. pacificus*).*
None: *No reports of* I. scapularis *or* I. pacificus *ticks.*

Figure 5.4.4-5. Lyme disease Risk – New York State



Source: American Lyme Disease Foundation, 2011

Blue oval represents approximate location of Chenango County.

Asian Long-horned Beetles (ALB)

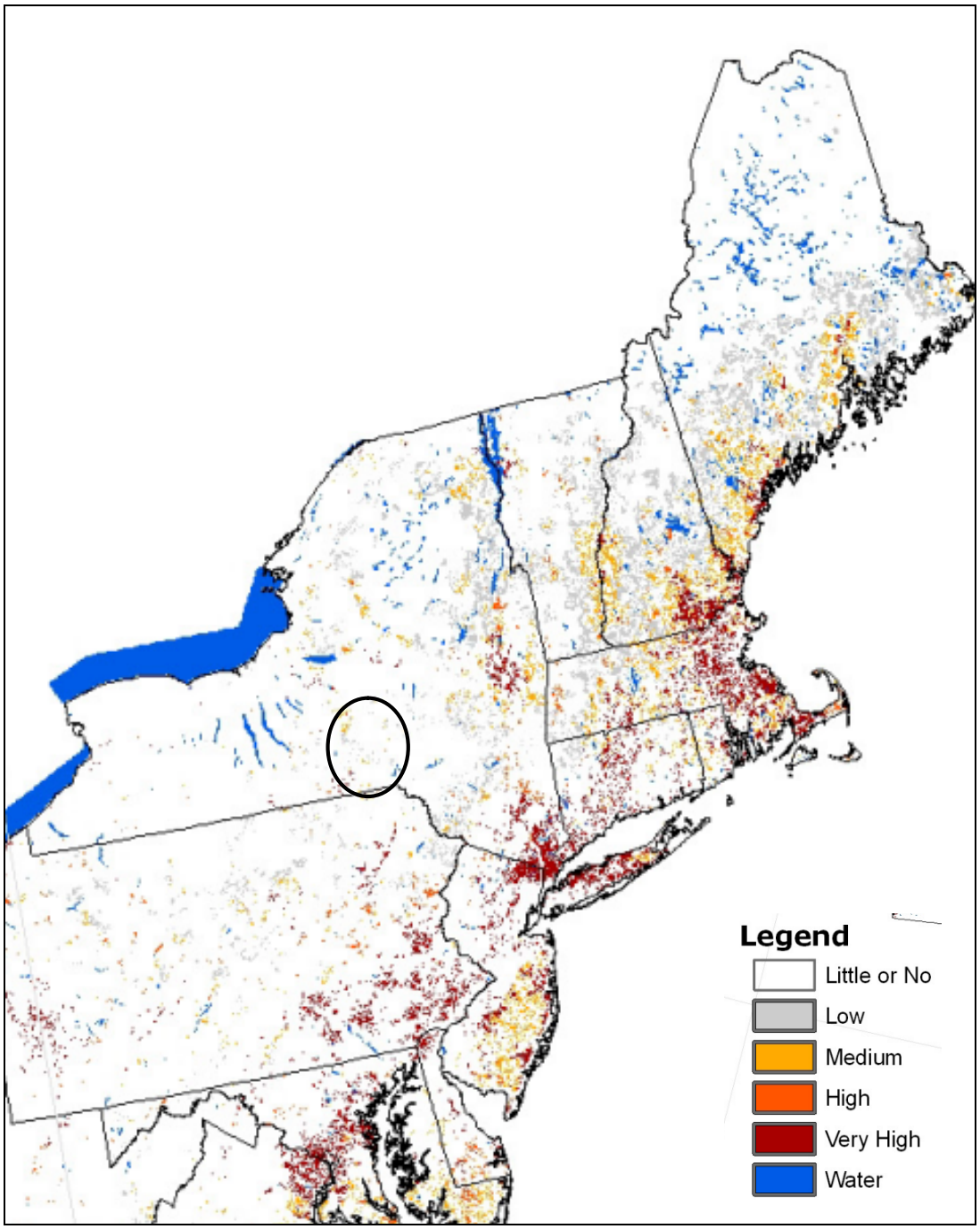
Although it is believed that this beetle arrived in the U.S. between the 1980's and 1990's, the ALB was first discovered in McCarren Park of Greenpoint, Brooklyn on August 19, 1996 and soon after in Amityville, Long Island in September 1996. Since then, infestations were found in and around New York City, including on Long Island, Manhattan, Queens and Flushing Park. At present, it has been found in several areas in New York City and Long Island, the Chicago area (the quarantine having been lifted on July 12, 2006), New Jersey, and Toronto, Canada. Additionally, the USDA's Animal and Plant Health Inspection Service (APHIS) detected ALB in 26 warehouses and residential sites in 14 states. This detection led to actions that prevented the ALB from getting outdoors.

The USDA-APHIS Plant Protection and Quarantine (PPQ) has implemented quarantine and control strategies and restrictions in New York State, Illinois, and New Jersey that seek to eradicate this serious pest from the U.S. Quarantine areas have been established where beetles or their damage have been found, as a legal measure taken by a state of federal agency to prohibit the spread of a pest from one area to another. Code of Federal Regulations (e-CFR), Title 7: Agriculture, PART 301—Domestic Quarantine Notices, have been developed by the USDA-APHIS for handling wood and planting trees in these ALB quarantine zones. The Nature Conservancy has indicated that if ALBs were to break out of the established quarantine areas and spread into upstate New York State and New England, they could cause a devastating economic blow to the sugar maple, tourism, timber, and forest product industries. Over 1.5 billion trees are susceptible across New England (The Nature Conservancy, 2007). Quarantine zones in New York State have been limited to New York City and Long Island; there have been none in Chenango County.

Sirex Woodwasp

The species is native to Europe, Asia, and North Africa. It can now be found within the northeast U.S. ranging from Michigan to New Hampshire. In New York State, the most affected species are scots pine, Austrian pine, and red pine from plantations dating to the mid-1900s. The damage to the underperforming trees has a minimal economic effect to the state (NYIS, 2013). Figure 5.4.4-6 displays Sirex Woodwasp susceptibility in the northeast U.S.

Figure 5.4.4-6. Sirex Woodwasp Susceptibility in the Northeast U.S.

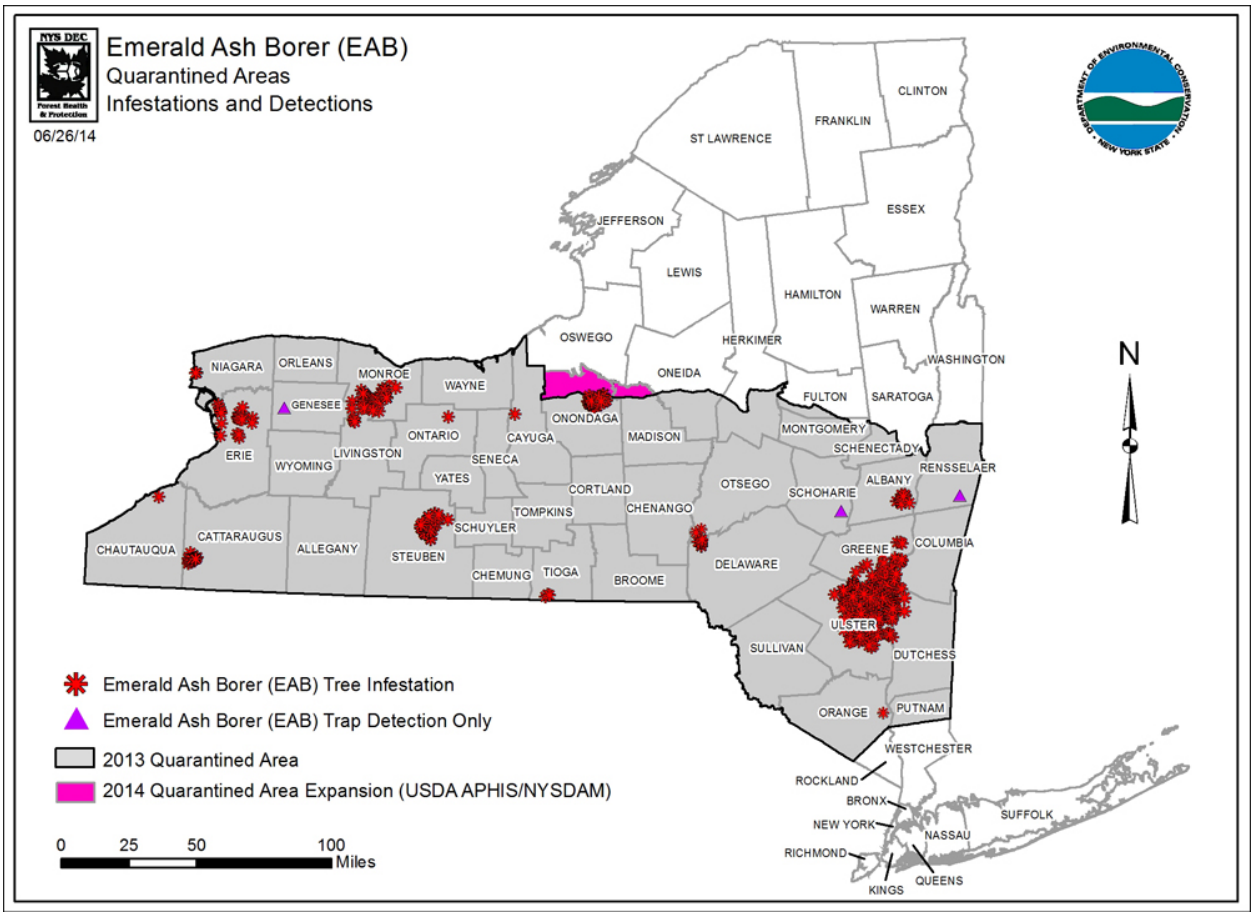


Source: USDA Forest Service, 2006
Note: The black circle indicates the approximate location of Chenango County.

Emerald Ash Borer

As of August 2010, Emerald Ash Borer has been confirmed in 15 states, including New York State and two Canadian provinces. A Federal quarantine is in place in entire or portions of states that have confirmed the presence of this insect. Figure 5.4.4-7 shows the location of the quarantine areas of New York State. Chenango County is included in the quarantined areas of the State.

Figure 5.4.4-7. Emerald Ash Borer Quarantined Areas in New York State



Source: NYSDEC, 2013

Previous Occurrences and Losses

Many sources provided historical information regarding previous occurrences and losses associated with infestation events throughout New York State and Chenango County. With so many sources reviewed for the purpose of this HMP, loss and impact information for many events could vary depending on the source. Therefore, the accuracy of monetary figures discussed is based only on the available information identified during research for this HMP.

Between 1954 and 2015, New York State was included in one infestation-related FEMA emergency declaration (EM) classified as a virus threat. Generally, these disasters cover a wide region of the State; therefore, they may have impacted many counties. However, not all counties were included in the disaster declarations. Chenango County was included in this declaration (FEMA, 2015).

Based on all sources researched, known infestation events that have affected Chenango County and its municipalities are described below. With infestation documentation for New York State being so extensive, not all sources have been identified or researched. Therefore, the descriptions may not include all events that have occurred throughout the County and region.

West Nile Virus (WNV and other mosquito-borne diseases)

WNV data ranging from 2000 to 2012 was provided by the NYSDOH, for all counties of New York State, including Chenango County (Table 5.4.4-1). This data indicates that approximately 1 human and 7 birds tested positive for WNV within Chenango County between 2000 and 2012, with no deaths occurring.

Table 5.4.4-1. WNV Positive Results for New York (State/ Chenango County) (2000 to 2012)

Year	Humans	Horses	Mosquito Pools	Birds	Others
2000	14 / 0	28 / 0	400 / 0	1,273 / 0	5 / 0
2001	15(2) / 0 (0)	22 / 0	316 / 0	803 / 0	0 / 0
2002	83(5) / 0 (0)	36 / 0	445 / 0	1,455 / 5	2 / 0
2003	71(10) / 0 (0)	32 / 0	471 / 0	1,368 / 2	3 / 0
2004	10 / 0	5 / 0	238 / 0	207 / 0	1 / 0
2005	38 / 0 (0)	2 / 0	387 / 0	300 / 0	0 / 0
2006	23 (4) / 0 (0)	2 / 0	380 / 0	264 / 0	0 / 0
2007	22 / 0	0 / 0	264 / 0	83 / 0	0 / 0
2008	46 (6) / 0 (0)	3 / 0	351 / 0	159 / 0	0 / 0
2009	7 (0) / 0 (0)	1 / 0	100 / 0	None listed	0 / 0
2010	129 (5) / 1 (0)	0 / 0	907 / 0	None listed	0 / 0
2011	44 (2) / 0 (0)	4 / 0	453 / 0	None listed	2 / 0
2012	103 (5) / 0 (0)	7 / 0	1,005 / 0	None listed	0 / 0
Total	**605 (39) / 1 (0)**	**142 / 0**	**5,717 / 0**	**5,912 / 7**	**13 / 0**

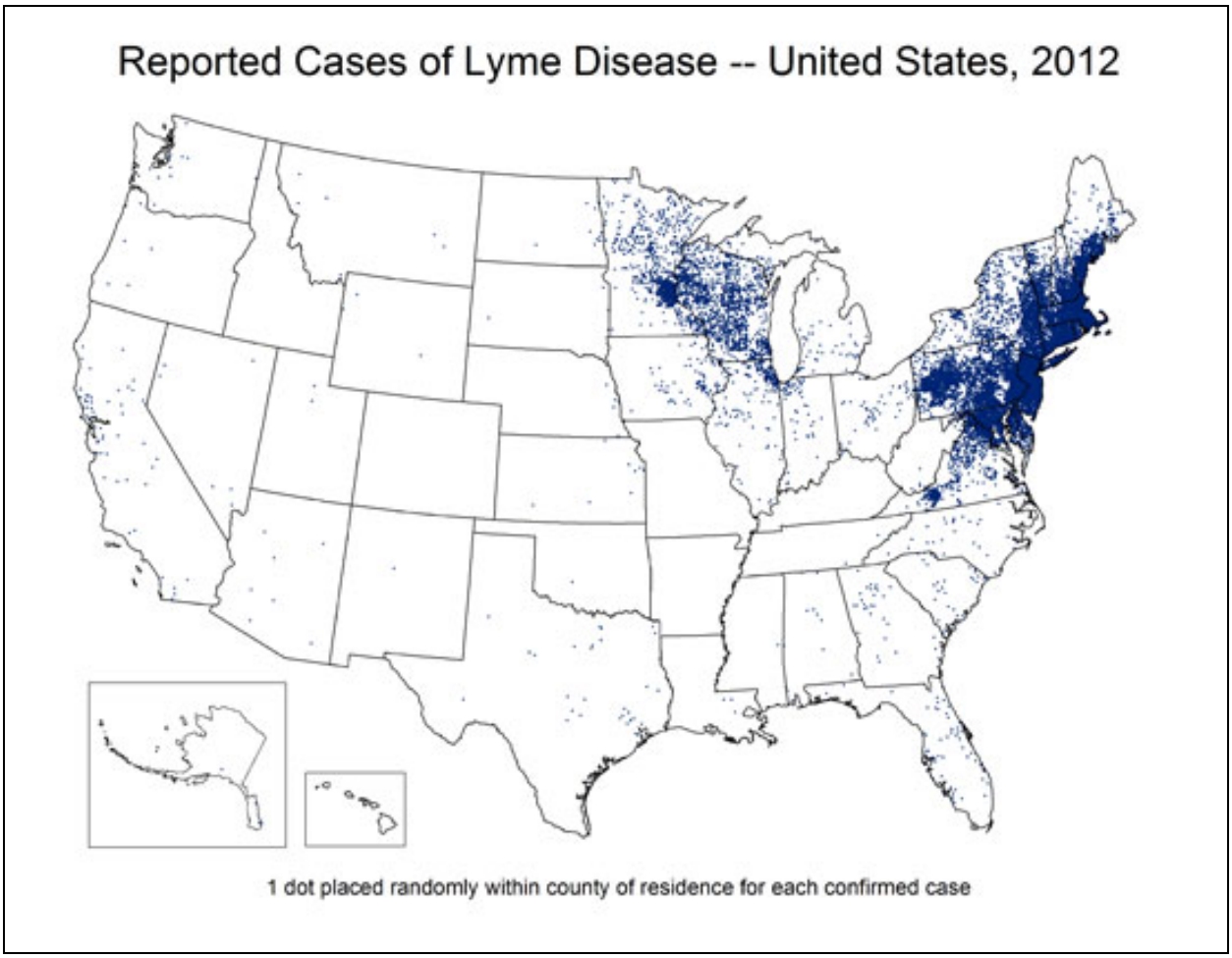
Source: NYSDOH, 2013

Notes: Data indicate the presence of the virus in specimens analyzed; they do not necessarily indicate ill or symptomatic specifies. Numbers in parentheses indicate deaths. "Other" positive result cases include those found in other types of mammals (i.e. bats, squirrels, chipmunks, rabbits).

Lyme Disease

In 2011, Lyme disease was the most commonly reported vector-borne illness in the U.S., according to CDC. As of October 2011, over 95,000 cases have been reported for New York State to the NYSDOH since Lyme disease became reportable in 1986 (NYSDOH, 2011). Since 2003, New York has a reported an average of over 4,200 cases per year (CDC, 2013). Chenango County reported 61 cases of Lyme disease between the years of 1992 to 2011 (CDC, 2013). Figure 5.4.4-8 shows confirmed cases in 2012.

Figure 5.4.4-8. Reported Cases of Lyme Disease in U.S. (2012)



Source: CDC, 2013

Asian Long-horned Beetle (ALB)

ALBs have caused serious tree losses in both New York State and Chicago, IL, particularly in New York City, but not in Chenango County. According to Senator Hillary Clinton in April 2007, the ALB puts 35 percent of American urban trees at serious risk, at a combined replacement value of $669 billion (U.S. Senate, 2007). Since its initial discovery in New York State in 1996, tree destruction and removal has been the only method for controlling the spread of ALB infestation.

Actual monetary losses associated with the destruction, removal and replanting of trees has not been clearly identified for New York State or Chenango County through review of available documentation.

Sirex Woodwasp

Impacts of the Sirex Woodwasp have been relatively minor in New York State, including Chenango County. The largest damage is being seen in Scots, Austrian, and red pine forests that are crowded, stressed, and underperforming (NYIS, 2013). Little economic or environmental impact is expected in Chenango County.

Probability of Future Events

Based on historical documentation, increased incidences of infestation throughout New York and the overall impact of changing climate trends, it is estimated that Chenango County and all its jurisdictions will continue to experience infestation events that may induce secondary hazards and health threats to the County population if infestations are not prevented, controlled or eradicated effectively. The Planning Committee views this as a "Frequent" hazard of concern (hazard event that occurs more frequently than once in 25 years) (see Table 5.3-3 in Section 5.3).

West Nile Virus (WNV)

WNV, never seen on this continent until 1999, has infected more than 37,000 people in the U.S. and killed more than 1,500 (CDC, 2013). Based on available data, it is expected that many more incidences will occur in the future throughout the U.S., including New York State. However, Chenango County has had only 1 human case and 7 bird cases since 2000. Therefore, based on all available information and available data regarding mosquito populations, it is anticipated that WNV infections will continue to be a low threat to Chenango County.

Lyme Disease

Disease-carrying ticks will continue to inhabit the northeast, including Chenango County, creating an increase in Lyme disease and other types of infections amongst the county population if not controlled or prevented. Ecological conditions favorable to Lyme disease, the steady increase in the number of cases, and the challenge of prevention predict that Lyme disease will be a continuing public health concern. Personal protection measures, including protective clothing, repellents or acaricides, tick checks, and landscape modifications in or near residential areas, may be helpful. However, these measures are difficult to perform regularly throughout the summer. Attempts to control the infection on a larger scale by the eradication of deer or widespread use of acaricides, which may be effective, have had limited public acceptance. New methods of tick control, including host-targeted acaricides against rodents and deer, are being developed and may provide help in the future (Steere, Coburn, and Glickstein, 2004). Currently and in the future, control of Lyme disease will depend primarily on public and physician education about personal protection measures, signs and symptoms of the disease, and appropriate antibiotic therapy. Based on available information and the ongoing trends of disease-carrying tick populations, it is anticipated that Lyme disease infections will continue to be a threat to Chenango County.

Asian Long-horned Beetle (ALB)

The spread of ALB to other tree populations should be preventable if USDA quarantine restrictions are followed with the ongoing monitoring of area trees for rapid detection of beetle infestations. According to the USDA APHIS, surveys, regulatory measures and control that the ALB problem can and should be eradicated. However, the USDA also indicates that if this beetle continues to spread, potential damage is significant throughout the U.S., including New York State and Chenango County.

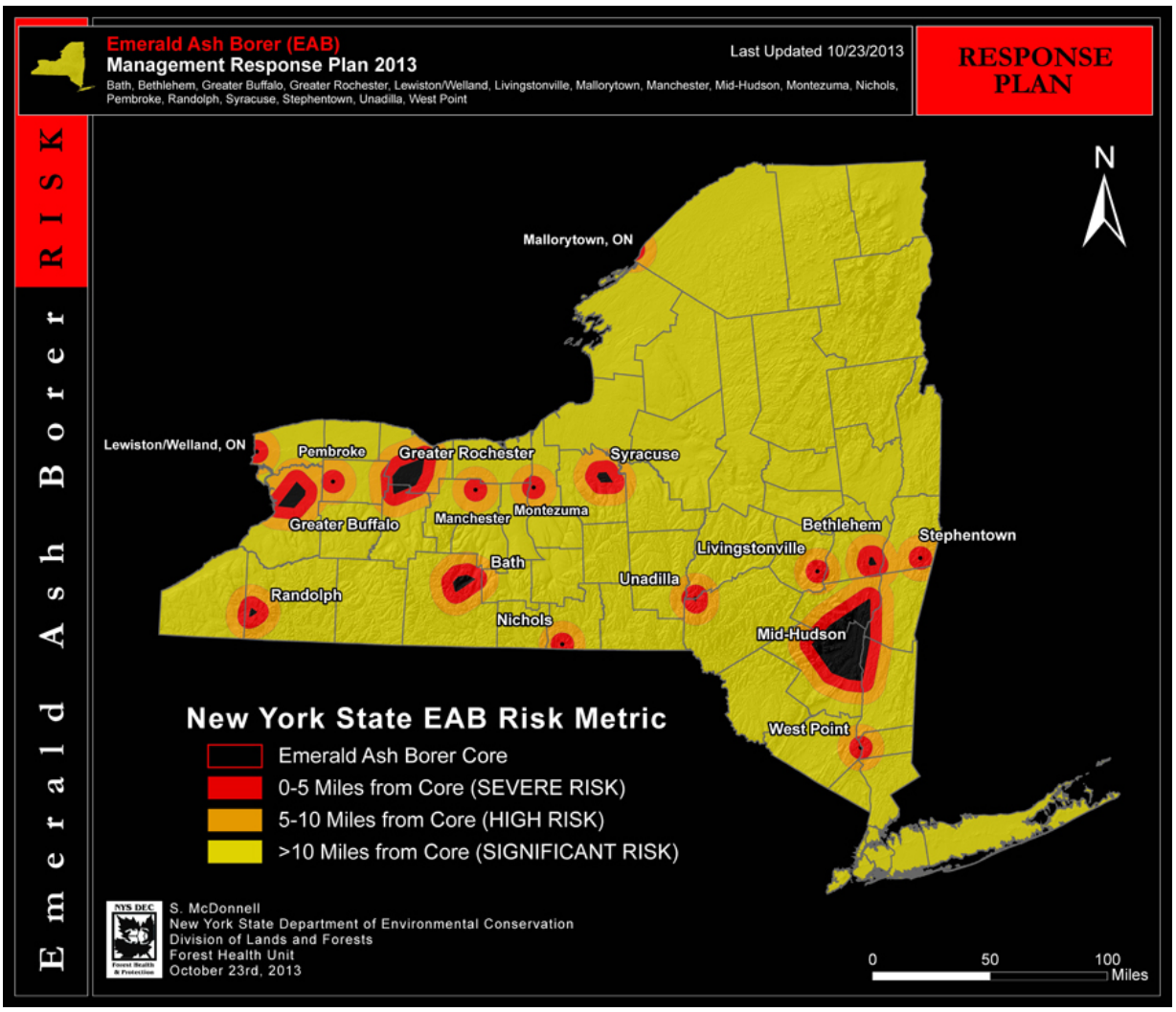
Sirex Woodwasp

The USDA Forest Service ranks Chenango County as having a medium introduction potential, and little to no establishment potential or susceptibility potential for Sirex Woodwasp infestations (USDA Forest Service, 2006).

Emerald Ash Borer

Figure 5.4.4-9 shows the EAB risk for New York State. The figure shows that the southeastern portion of Chenango County is at high to severe risk for EAB infestation.

Figure 5.4.4-9. Emerald Ash Borer Risk in New York State.



Climate Change Impacts

Climate change is beginning to affect both people and resources in New York State, and these impacts are projected to continue growing. Impacts related to increasing temperatures and sea level rise are already being felt in the State. ClimAID: the Integrated Assessment for Effective Climate Change in New York State (ClimAID) was undertaken to provide decision-makers with information on the State's vulnerability to climate change and to facilitate the development of adaptation strategies informed by both local experience and scientific knowledge (New York State Energy Research and Development Authority [NYSERDA], 2011).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Chenango County is part of Region 3, Southern Tier. Some of the issues in this region, affected by climate change, include: dairy dominates the agricultural economy and milk production losses are projected,

Susquehanna River flooding increases, and this region is one of the first parts of the State hit by invasive insects, weeds and other pests moving north (NYSERDA, 2011).

Temperatures in New York State are warming, with an average rate of warming over the past century of 0.25° F per decade. Average annual temperatures are projected to increase across New York State by 2° F to 3.4° F by the 2020s, 4.1° F to 6.8° F by the 2050s, and 5.3° F to 10.1° F by the 2080s. By the end of the century, the greatest warming is projected to be in the northern section of the State (NYSERDA, 2014).

Regional precipitation across New York State is projected to increase by approximately one to eight-percent by the 2020s, three to 12-percent by the 2050s, and four to 15-percent by the 2080s. By the end of the century, the greatest increases in precipitation are projected to be in the northern areas of the State (NYSERDA, 2014).

In Region 3, it is estimated that temperatures will increase by 3.6ºF to 7.1ºF by the 2050s and 4.2ºF to 11.6ºF by the 2080s (baseline of 47.5ºF). Precipitation totals will increase between 2 and 15% by the 2050s and 3 to 16% by the 2080s (baseline of 35 inches). The changes in temperature and precipitation are likely to produce an increase in extreme heat, intense precipitation, and more occurrences of short-duration warm season droughts. Both heavy precipitation events and warm season droughts are projected to become more frequent and intense during this century. Table 5.4.4-2 displays the projected seasonal precipitation change for the Southern Tier ClimAID Region (NYSERDA, 2014).

Table 5.4.4-2. Projected Seasonal Precipitation Change in Region 3, 2050s (% change)

Winter	Spring	Summer	Fall
+5 to +15	0 to +15	-10 to +10	-5 to +10

Source: NYSERDA, 2011

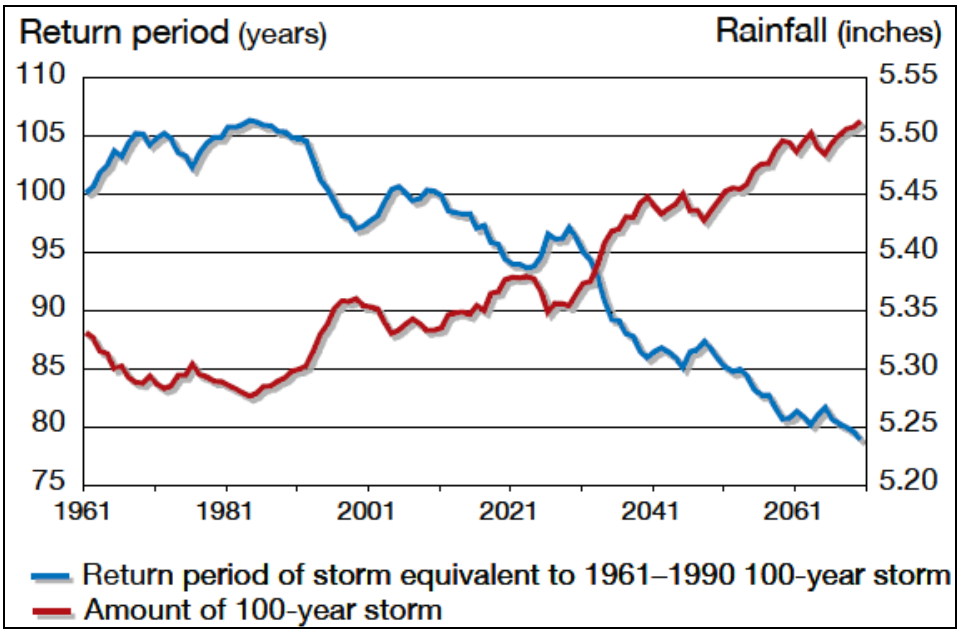
The projected increase in precipitation is expected to fall in heavy downpours and less in light rains. The increase in heavy downpours has the potential to affect drinking water; heighten the risk of riverine flooding; flood key rail lines, roadways and transportation hugs; and increase delays and hazards related to extreme weather events (NYSERDA, 2011).

Increasing air temperatures intensify the water cycle by increasing evaporation and precipitation. This can cause an increase in rain totals during events with longer dry periods in between those events. These changes can have a variety of effects on the State's water resources (NYSERDA, 2011).

Over the past 50 years, heavy downpours have increased and this trend is projected to continue. This can cause an increase in localized flash flooding in urban areas and hilly regions. Flooding has the potential to increase pollutants in the water supply and inundate wastewater treatment plants and other vulnerable facilities located within floodplains. Less frequent rainfall during the summer months may impact the ability of water supply systems. Increasing water temperatures in rivers and streams will affect aquatic health and reduce the capacity of streams to assimilate effluent wastewater treatment plants (NYSERDA, 2011).

Table 5.4.4-10 displays the project rainfall and frequency of extreme storms in New York State. The amount of rain fall in a 1% annual chance (100-year) event is projected to increase, while the number of years between such storms (return period) is projected to decrease. Rainstorms will become more severe and more frequent (NYSERDA, 2011).

Figure 5.4.4-10. Projected Rainfall and Frequency of Extreme Storms



Source: NYSERDA, 2011

Total precipitation amounts have slightly increased in the Northeast U.S., by approximately 3.3 inches over the last 100 years. There has also been an increase in the number of two-inch rainfall events over a 48-hour period since the 1950s (a 67-percent increase). The number and intensity of extreme precipitation events are increasing in New York State as well. More rain heightens the danger of localized flash flooding, streambank erosion and storm damage (DeGaetano et al [Cornell University], 2011).

With the projection of temperature and rainfall increase due to climate change, there is evidence that climate change may be a factor in the expansion of infectious diseases in the U.S. Mosquitos capable of carrying and transmitting diseases now live in at least 28 states. As temperatures increase and rainfall patterns change, these insects can remain active for longer seasons and in wider areas. Lyme disease could expand throughout the U.S. and northward into Canada, as temperatures warm, allowing ticks to move into new regions. Warmer temperatures, heavy rainfall and high humidity have reportedly increased the rate of human infection of WNV (Natural Resources Defense Council 2013).

5.4.4.2 Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For infestation, Chenango County has been identified as the hazard area. Therefore, all assets in Chenango County, as described in the County Profile section, are vulnerable to infestation. The following text evaluates and estimates the potential impact of infestation on the County including:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact on: (1) life, health and safety of residents, (2) general building stock, (3) critical facilities, (4) economy, and (5) future growth and development
- Effect of climate change on vulnerability
- Change of vulnerability as compared to that presented in the 2008 Chenango County Hazard Mitigation Plan
- Further data collections that will assist understanding this hazard over time

Overview of Vulnerability

Infestation is a significant concern to Chenango County, mainly due to its impact on public health and natural resources. Estimated losses are difficult to quantify; however infestation can impact Chenango County's population and economy. Direct impacts of infestation have cascading indirect impacts. As vegetation dies or becomes stressed/weakened by pests such as the ALB, there is an increase in available fuel and increase in high intensity wildfires. As species composition changes due to infestation outbreaks, whole fire regimes can shift. Physical stresses on trees may also affect how street trees respond to physical stresses caused by other natural hazards such as hurricanes, drought and ice storms (Kurtz, 2007).

Data and Methodology

Due to a lack of quantifiable loss information, a qualitative assessment was conducted to evaluate the assets exposed to this hazard and the potential impacts associated with this hazard.

Impact on Life, Health and Safety

The entire population of Chenango County is vulnerable to infestation. According to the 2010 U.S. Census, the County had a population of 50,477. The elderly population and people with suppressed immune systems are most susceptible to the effects of WNV. According to the 2010 U.S. Census, Chenango County's population of 65 and over was 8,403.

Impact on General Building Stock and Critical Facilities

No structures are anticipated to be directly affected by infestation.

Impact on Economy

The impact infestation has on the economy and estimated dollar losses are difficult to measure and quantify. Costs associated with the activities and programs implemented to conduct surveillance and address infestation have not been quantified in available documentation. Instead, activities and programs implemented by the County to address this hazard are described below, all of which could impact the local economy.

Emerald Ash Borer

Ash trees were widely planted in the urban and suburban areas of New York State to replace native elm trees that were killed by Dutch elm disease. The loss of large numbers of mature ash trees can have a devastating impact on the urban and suburban canopy, which can lead to localized temperature changes, increased energy costs, increased water usage for irrigation, increased stormwater runoff, and increased air pollution. The economic impact of removing and replacing thousands of dead trees in yards and along streets, and the potential public safety hazards and liability issues of dead ash trees along streets, in parks, and in yards can be a challenge for communities and homeowners impacted by EAB. In addition, ash trees are valuable commercially and used for the manufacturing of flooring, furniture, shipping pallets, and baseball bats. Nearly 114 million board feet of ash lumber is grown each year in the eastern U.S. which is worth approximately $25 billion (New York Invasive Species Information, 2014).

The New York State Department of Agriculture and Markets (NYSDAM) created quarantine areas throughout the State. As of May 1, 2013, there are 42 counties that are included in the quarantine area, which includes Chenango County. The quarantine order restricts the movement of certain regulated articles within New York State (New York Invasive Species Information, 2014). These articles cannot be moved out of the quarantined zone and includes the following:

- Ash nursery stock
- Any of ash trees, bark, stumps, limbs, branches, and roots
- Any particle, product or means of conveyance determined by USDA or New York State to present a risk of spreading the EAB infestation
- Any material comingled with a regulated article and therefore indistinguishable from the regulated article
- Firewood from any species
- Wood chips and bark mulch from any tree species, larger than one inch in two dimensions
- Living EAB in any stage of development (New York Invasive Species Information, 2014)

Asian Longhorned Beetle

ALB gallery development and exit holes weaken the integrity of infested trees and can eventually result in death of severely infested trees. National and State forests, parks, and private backyards could be impacted, as could such forest-dependent industries such as lumber, maple syrup, house and furniture manufacturing, and commercial horticulture and nursery stock (New York Invasive Species Information, 2014).

Steps taken to address and eradicate ALB may be costly to local governments and impact the economy. As stated earlier, these steps include: (1) quarantine infested areas; (2) cut, chip and burn infested trees; (3) apply of insecticide treatments to decrease beetle populations and prevent future tree loss; and (4) survey impacted areas. Additional costly actions to address ALB include the replanting of trees to make up for the trees removed or destroyed. Lastly, the clean-up and removal of tree debris as a result of severe weather may be prolonged and more costly due to the need to adhere to quarantine areas.

Impact of Future Growth and Development

As discussed in Section 4, areas targeted for future growth and development have been identified across the County. Any areas of growth could be potentially impacted by the infestation hazard because the entire planning area is exposed and vulnerable.

Change of Vulnerability

Overall, the County's vulnerability has not changed since the 2008 original HMP and the entire County will continue to be exposed and vulnerable to infestation.

Additional Data and Next Steps

For the Plan Update, any additional information regarding localized concerns and past impacts will be collected and analyzed. This data will be developed to support future revisions to the plan. Mitigation efforts could include building on existing New York State, Chenango County, and local efforts.