

**Asian Longhorned Beetle Cooperative  
Eradication Program Strategic Plan**  
*December 2005*



USDA, APHIS  
Asian Longhorned Beetle Eradication Program  
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*A collaborative project of:*

USDA-APHIS-PPQ \* US Forest Service \* New York State Department of Agriculture and Markets \* New York City Department of Parks and Recreation \* City of Chicago, Department of Streets and Sanitation, Bureau of Forestry \* Illinois Department of Agriculture \* New Jersey Department of Agriculture \* New York State Department of Environmental Conservation \* New Jersey Department of Environmental Protection

**Eradication of Asian Longhorned Beetle in New York, New Jersey, and Illinois  
Implementation of the Strategic Plan  
December 2005**

**EXECUTIVE SUMMARY**

The Asian Longhorned Beetle (ALB), *Anoplophora glabripennis*, a destructive wood-boring pest of maple and other hardwoods, was first discovered in the United States in Brooklyn, New York, in August 1996 and was later detected in Chicago, Illinois, in July, 1998. In October 2002, the beetle was found in Hudson County, New Jersey, and then in Middlesex and Union Counties, New Jersey, in August 2004. The potential for economic, social, and environmental effects if this wood-boring pest was to become widespread in the United States is extensive. Several industries would feel the impact including timber, maple syrup, tree nurseries, greenhouses, and tourism. Since 1996, APHIS; State and City cooperators in New York, Illinois, and New Jersey; and the US Forest Service have undertaken eradication activities by imposing regulated boundaries, conducting survey and control activities around confirmed sites, removing infested trees, and planting trees to restore areas where trees were removed. To date, over 8,000 infested trees have been removed in the program areas.

The primary objective is to protect the forest products industry, the biological diversity of our hardwood forests and park lands, and the quality of the urban environment from the destructive effects of the ALB through its containment and eradication. Implementation of the initiative follows emergency response guidelines that specify the protocols for survey, control, and regulatory activities for areas infested with the ALB. The guidelines are adjusted for each specific site, taking into consideration local environmental conditions, host status and dynamics, pest population dynamics, and epidemiological considerations.

As negative confirmation surveys are completed, areas are evaluated for their potential to be deregulated and declared eradicated of ALB based on the success of survey and treatment activities as well as the proximity to other infested areas. Program activities are expected to continue through 2020; however, successful chemical treatments and intensive surveys continue to reduce ALB populations, and, as a result, the program has deregulated some areas. This document proposes an aggressive joint Federal, State and local initiative to eliminate the pest from the United States and protect vulnerable urban, forest, and agricultural resources at risk.

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**I. Introduction**

The Asian Longhorned Beetle (ALB), *Anoplophora glabripennis*, is a destructive wood-boring pest of maple and other hardwoods. This exotic pest was first discovered in the United States in Brooklyn, New York, in August 1996 and was detected in Chicago, Illinois, in July, 1998. In October 2002, the beetle was found in Hudson County, New Jersey, and then in Middlesex and Union Counties, New Jersey, in August 2004. The beetle is native to China and as such has few natural enemies in the United States. ALB successfully attacks and kills healthy trees. In 1992, China reported over \$200 million direct loss due to damage to poplar trees. Even more foreboding, Chinese pest managers use North American hosts such as sugar maple as trap trees and logs in poplar plantations to reduce beetle damage and protect their native hosts. The ecological and host range of this insect in Asia suggests that it probably can occur almost anywhere in the United States.

The potential for economic, social, and environmental effects if these wood-boring pests were to become widespread in the United States is extensive. ALB attack and cause damage to many different hardwood trees including maple, horse chestnut, poplar, willow, and elm. Several industries would feel the impact including timber, maple syrup, tree nurseries, greenhouses, and tourism. In addition, many of these species are popular street trees in the urban environment. According to a 2001 Forest Service/APHIS study, the total value of tree resources at risk in the Cities of Chicago and New York is \$1.2 billion and \$2.3 billion, respectively. The estimated potential national impact of ALB if every urban area in the continental United States becomes totally infested is a loss of about 35% of the canopy cover, 30% of the trees (1.2 billion trees) and \$669 billion dollars in compensatory value. Besides the aesthetic, recreational, and production value of trees and wooded areas, other benefits are multifold and include cleaning the air of pollutants, microclimate effects, diminution of storm water runoff, reduction in street noise, and enhancement of local wildlife populations.

Since 1996, APHIS; State and City cooperators in New York, Illinois, and New Jersey; and US Forest Service have undertaken eradication activities imposing regulated boundaries, conducting survey and control activities around confirmed sites, and removing infested trees. To date, over 8,000 infested trees have been removed in the program areas: over 6,000 in New York, 1,500 in Chicago, and 600 in New Jersey in addition to more than 13,000 high-risk host trees. APHIS and the Forest Service work with State and City agencies to replace trees that are removed because of ALB. With new control technologies and dedicated survey efforts, the number of ALB-infested trees has begun to decrease, most notably in Chicago, Illinois, where only a small portion of the previously infested area remains regulated. Additionally, the Hudson County, New Jersey, area is deregulated. This document outlines the joint Federal, State, and local initiative to continue the elimination of the pest from the United States and protect vulnerable urban, forest, and agricultural resources at risk.

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## **II. Primary Objective**

The primary objective is to protect the forest products industry, the biological diversity of our hardwood forests and park lands, and the quality of the urban environment from the destructive effects of ALB through its containment and eradication.

## **III. Implementation Guidelines and Tactics**

Implementation of the program follows emergency response guidelines developed in year 2000, and revised in 2006, by scientists and program managers with experience in pest management and control and ALB. These guidelines specify the protocols for survey, control, and regulatory activities for areas infested with the ALB. The guidelines are adjusted for each specific site, taking into consideration local environmental conditions, host status and dynamics, pest population dynamics, and epidemiological considerations.

Surveys are organized into four levels to search for indications of beetle presence. The core area, known as Level 1, is composed of the area found within a 1/2 mile radius of an infested tree. Delimiting surveys, referred to as Level 2, are conducted at a range between a 1/2 mile and 1-1/2 miles from infested trees. Level 3 surveys include regulatory inspections of tree care companies and related wood-handling industries that conduct business in proximity to the regulated areas as well as inspection of ALB host trees in the vicinity of the establishment. Level 4 surveys consist of the inspection of selected locations up to 25 miles from known infested areas. The intensity and frequency of inspection in each survey level is set according to risk-based protocols.

The control of ALB involves a combination of the removal of infested host trees, removal of hosts within close proximity to an infested tree, and chemical treatment. Trees discovered with signs of beetle presence, such as exit holes, oviposition sites, or the beetle itself, are removed. ARS research results on dispersal and flight ability and APHIS methods development analysis of detection data in Chicago indicate that conducting control activities within 1/2 of a mile radius of an infested tree will encompass greater than 99% of the area in which adult beetles are likely to disperse. Within this half mile radius, the program assesses area-specific characteristics such as host availability, pest population levels, and potential for spread to determine the most effective combination of chemical treatments and tree removal to reduce the likelihood of additional ALB infestations in proximity to infested trees. Chemical treatments of uninfested host trees are applied annually and began in select areas around infested trees in the year 2000 in Illinois, 2001 in New York, and 2003 in New Jersey. Treatments are conducted in each area for a minimum of three years.

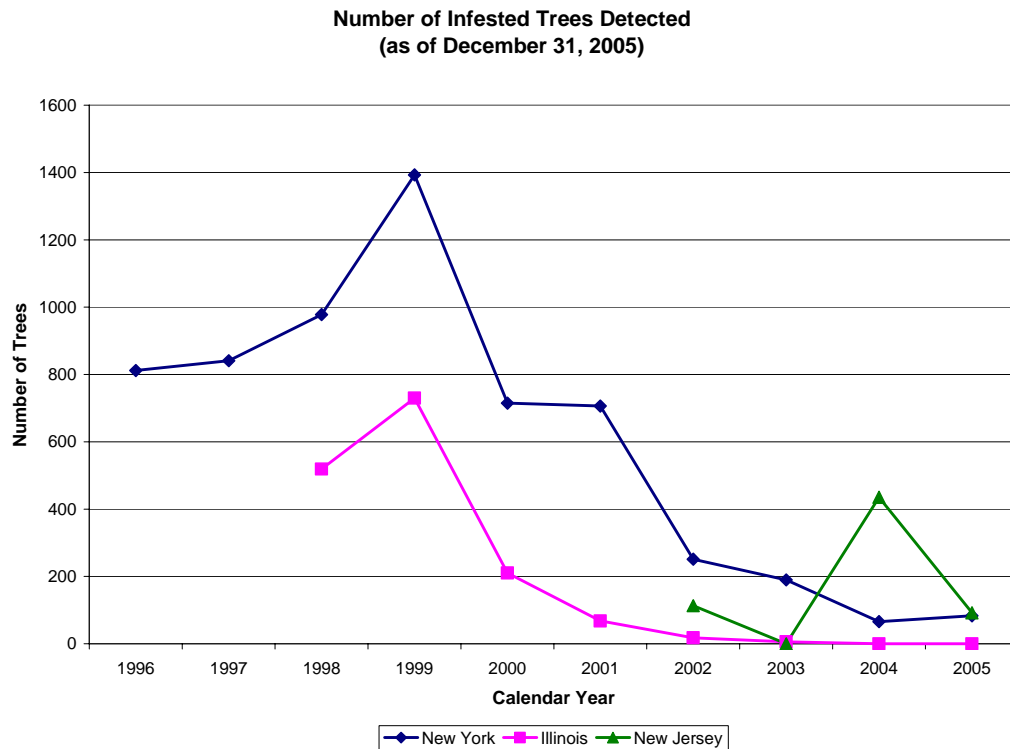
Ongoing regulatory activities aim to prevent the artificial spread of the pest to new areas. The scope of regulatory activity is commensurate with risk as determined in the guidelines. Removal of regulated boundaries for an area occurs when two successive annual core and delimiting surveys are negative for active signs of beetle activity or the presence of ALB. When four successive annual core and delimiting surveys are negative for active signs of beetle activity or the presence of ALB, eradication is declared.

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In addition to the above measures, the program utilizes various strategies in order to maximize public support and cooperation as well as program effectiveness. One such activity is the planting of nonhost trees by the US Forest Service to replace infested and high-risk trees that require removal. To date, the various program areas have replaced over 10,000 trees. Ongoing public awareness campaigns engage the community. The general public detected several ALB infestations, some of which led to the establishment of new regulated areas. Additionally, increased awareness creates a more cooperative environment for the completion of survey and treatment tasks. To monitor program effectiveness and progress towards eradication, the program uses data management systems as well as geographic information systems, data analysis, and quality assurance components.

**IV. Performance Measures**

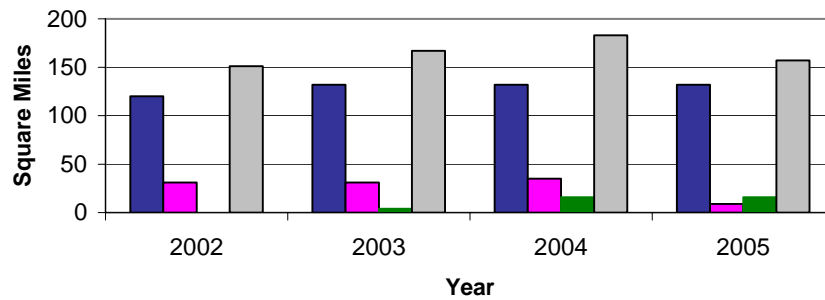
Two primary performance elements measure the success of the ALB program. The first is the number of infested trees found each year. Overall, numbers have continued to decrease since 1999. The exception to this trend is the increase in the number of trees found in New Jersey due to the 2004 discovery of ALB in the Middlesex/Union County area of New Jersey. DNA analysis demonstrated that the outbreak was a separate introduction and not a result of spread from the New York area.



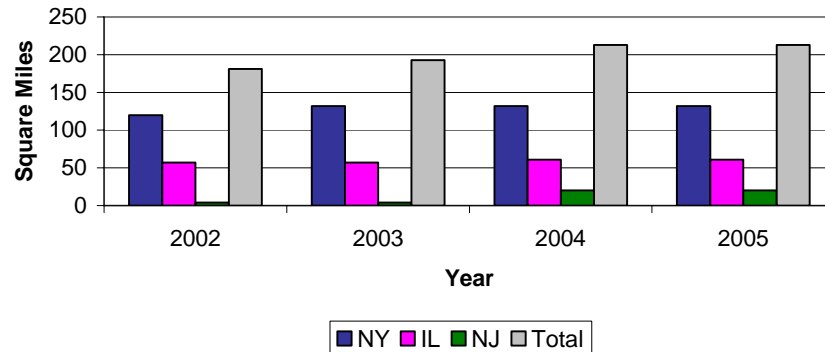
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The amount of square miles classified as regulated and infested each year is the second performance parameter. To control movement of host materials from infested areas, regulated boundaries, or quarantines, are used. Once an area obtains negative survey results in two consecutive years, it can be deregulated. Until four successive surveys report negative results, an area is considered infested.

**Regulated Area  
(as of 12/05)**



**Infested Area  
(as of 12/05)**



**V. Eradication Action Plan**

Implementation of the action plans for Illinois, New York, and New Jersey requires a coordinated effort from local, State, and Federal program leaders. The plans incorporate the components and tactics outlined above and are sufficiently flexible to accommodate most adjustments or modifications if the scope of the program changes or if alternative methodologies or technologies become available.

Each program state has distinct outbreak areas. New Jersey has two areas of infestation: Hudson County and Middlesex/Union Counties. The Hudson County regulated area is now deregulated. New York also has two generally infested areas: Brooklyn/Queens in New York City and Central

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Long Island. Manhattan is a satellite outbreak of the New York City infestation and Islip is a satellite of Central Long Island. Illinois has one large generally infested area in Chicago and several smaller satellite outbreaks in Addison, Park Ridge, Summit, and O'Hare. Through successful program initiatives; however, all but a small section of the Chicago area—Oz Park—has been deregulated.

### **V.1 General Strategy for Eradication**

The eradication program integrates survey, regulatory, tree removal, chemical treatment, and public awareness components in an area-wide pest management strategy. Each infested area receives a minimum of three years of chemical control. Surveys are conducted for a minimum of four years with at least two years of the survey conducted using bucket trucks and tree climbers to ensure beetle eradication. Until full eradication occurs in a region, survey, regulatory activities, and public outreach continue.

#### Illinois

The last ALB in Chicago, Illinois, was found in 2003, and 26 of the 35 square miles are deregulated. Deregulation of the remaining 9 square miles is planned for 2006. The final chemical treatment is planned for 2006, with confirmation surveys conducted through 2007 to verify the eradication of the beetle in this area.

#### New Jersey

Hudson County has not had any detections since ALB was discovered in this area in 2002; therefore, chemical treatments are complete and this 4 square mile area was deregulated in 2005. A final survey will be conducted in 2007 to confirm eradication.

The Middlesex/Union Counties regulated area is 16 square miles. Chemical treatments and other control measures will continue in this area of New Jersey through 2008. Additionally, surveys will continue through 2011 to ensure eradication of the ALB.

#### New York

The regulated area in NY is the largest of the ALB program areas. The eradication of the beetle is done in stages, working west to east in New York City and east to west in Long Island. Ground survey will aim to detect any infestations in an area while chemical treatments are applied. Chemical treatments are followed by intensive survey using aerial inspection methods.

#### *Long Island*

The satellite infested area of Islip has not had a detection since 2002. Treatment applications are complete and confirmation surveys are scheduled for completion in 2009.

Eradication in Central Long Island will occur in several sections due to its large size. Chemical treatments and intensive surveys will be conducted through 2017.

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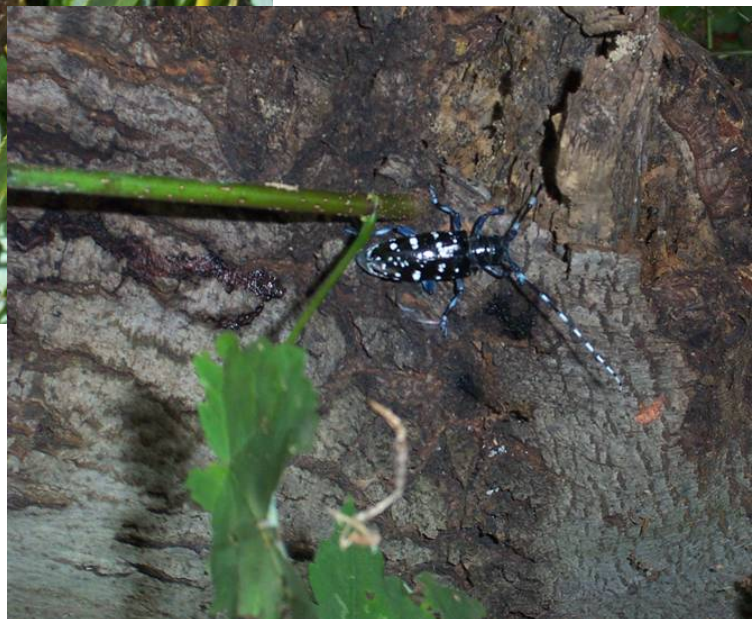
*New York City*

Lower Manhattan has had 5 years of chemical treatment (2001-2005). This area will be removed from chemical treatment in 2006 since an infestation has not been detected there since 2002. Treatments will be concentrated in the midtown area of Manhattan through 2007. Survey will continue through 2008 to confirm eradication of the ALB.

Brooklyn is divided into two sections for treatment. The first area requires an additional year of chemical treatment due to difficulties in obtaining access to properties and the high number of infested trees detected in the area; therefore, treatment will continue through 2008 in the western portion of the regulated area. Between 2008 and 2010, treatment of the remaining section of Brooklyn will occur. To ensure eradication of the beetle from the area, intensive surveys will be completed for both areas in 2009 and 2010.

The Queens regulated boundary covers the largest area; therefore, treatment and survey activities are divided into several sections. Treatment and survey will be carried out in six sections moving west to east. Treatment of the first section will be completed in 2007 with the remaining areas being treated from 2010 through 2019. The survey portion of the eradication plan will be conducted between 2008 and 2020.

As the activities progress in Central Long Island and New York City, areas will be evaluated for their potential to be deregulated and declared eradicated based on the success of survey and treatment activities as well as their proximity to other infested areas.



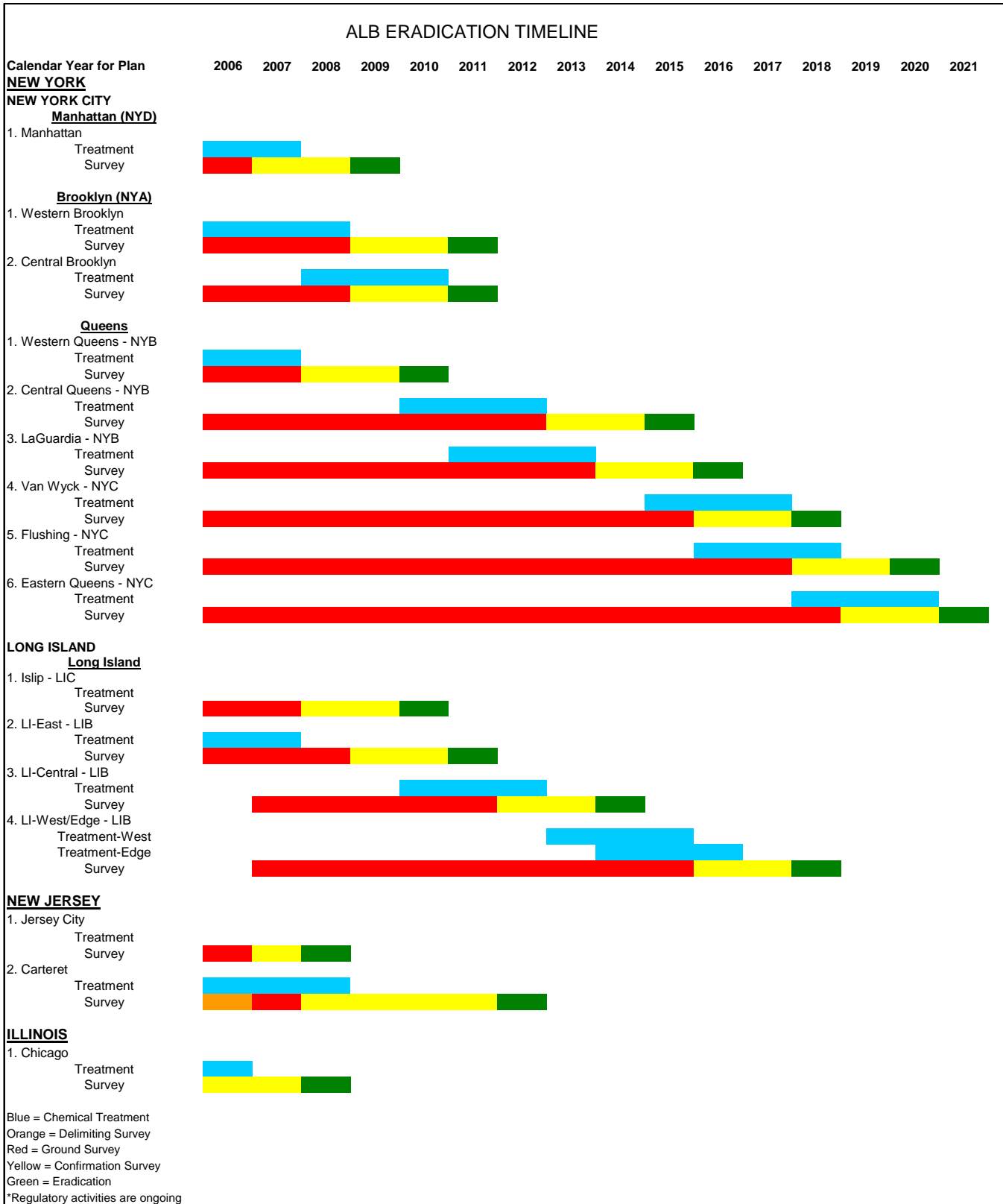
*Left: ALB damage on willow branch;  
Right: ALB adult*



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**V.2 Prevention and Early Detection**

The USDA's Animal and Plant Health Inspection Service (APHIS) pest risk analysis indicates that ALB hitchhiked to the United States in wood packing materials (WPM), such as crates and pallets, from China. In the last 15 years, the US import of goods from China has increased tremendously to \$196.7 billion a year in 2004, which is up from less than \$12 billion in 1989. As a result, the volume of pallets and crates passing through ports of entry has grown exponentially. In an effort to prevent additional infestations of ALB, USDA APHIS published a final rule, effective September 16, 2005, requiring that all wood packing material used in foreign trade be heat-treated or fumigated prior to arrival in the United States.

At the national level, APHIS is continuing to take several additional steps to protect against the beetle, including issuing pest alerts to U.S. port-of-entry personnel, conducting outreach to local importers, targeting high-risk importers and exporters for outreach, and increasing inspections of WPM at ports of entry.

Early detection is essential to successful and efficient eradication of an exotic pest. Discovering the pest when the infestation is small in size allows managers more flexibility when choosing tactics and control methodologies and provides a greater chance of success for eradication. Upon discovery, immediate and aggressive actions to eliminate the pest result in shorter and less expensive eradication programs. In 2000, APHIS implemented a national survey for ALB at high-risk importing establishments throughout the United States to determine if there are any other incipient infestations of ALB or other exotic wood borers. The Exotic Wood Borer/Bark Beetle National Survey, as it is known, aims to conduct pathway analyses, inspections, and trapping activities in high-risk areas; stress the importance of the submission of timely and accurate reports; and make the public aware of wood pests.

**VI. Scientific Support**

Scientific support plays a significant role in the development of the program and is expected to contribute additional technical advancements and program efficiencies throughout the life of the program. Major accomplishments thus far include: 1) quality assurance studies that led to the use of bucket trucks and tree climbers—a more effective survey methodology; 2) studies and data analysis that estimate the natural dispersal rate and host selection of ALB that form the basis of the survey, regulatory, and control guidelines; 3) development of several chemical treatment methods to augment tree removal resulting in a more environmentally sound control strategy that allows the program to be proactive and accelerate eradication; and 4) a uniform data management system to aid in decision making and operations as well as research on dispersal, infestation dynamics, and host relations. Ongoing research and methods development is expected to provide additional improvements and enhancements to program components such as alternative methods of chemical control as well as improved technologies in areas such as data collection and storage.

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**VII. Role of Cooperators**

The present plan has been produced in collaboration and consultation with State and local cooperators and the US Forest Service. The USDA APHIS and State and local cooperators manage the survey, regulatory, control, data management, and public awareness operations in the outbreak areas; however, the specific roles of cooperators vary in each state. Program managers determine roles and responsibilities in each State as dictated by legal authorities, expertise, administrative and technical strengths as well as available staff, resources, and equipment. The USDA APHIS and State cooperators also conduct the Exotic Wood Borer/Bark Beetle National Survey, which is targeted at areas in proximity to distribution centers, warehouses, manufacturers, and other entities that receive shipments of materials from international sources. In addition, the USDA APHIS has a continued public awareness campaign to augment ongoing ALB exclusion efforts at the ports of entry.

The USDA Forest Service assists affected communities and neighborhoods recover from the loss of their trees. This recovery assistance includes seed money for replacement of trees as well as direct technical assistance and information programs directed towards the selection, care, and maintenance of trees. The Forest Health Technology Enterprise Team will continue to collaborate with the APHIS Otis Methods Center and other agencies on: developing methods for the control of adult and immature ALB, traps/trapping strategies for adult ALB, and other high priority technology to support the detection and eradication goals of the ALB program. The Forest Health Protection staff will continue its efforts to assist APHIS PPQ and local officials in the detection and eradication of existing ALB infestations by conducting activities to enhance the likelihood of detecting currently unfound ALB infestations outside of New York, New Jersey, and Illinois through targeted surveys and information directed at tree care experts and related professions.

**VIII. Public Awareness and Outreach**

The ALB cooperative eradication project public outreach program is an important mechanism of the fight against this tree killing pest. Since the beetle is difficult to detect and there are presently no effective lures/traps for this insect, the more people trained to spot and report signs of the beetle, the better our eradication effort will be.

An annual advertising campaign is printed in major newspapers in program areas during flight season, which is June through October. The ad urges people to be aware of the beetle and to call local hotlines or office numbers to report a suspect beetle or damage caused by the beetle. Several infested trees and satellite outbreaks were discovered through public reporting. Work with local professionals throughout the program area, including but not limited to arborists, landscapers, nursery managers, foresters, garden clubs, and extension specialists, is also a continuing effort as part of the educational outreach program. Outreach is accomplished through the printing and continued distribution of ALB educational materials in addition to attending local events and making presentations to the varied professionals in this field of work.

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**IX. Budget and Equipment**

The primary components of the program are survey, regulatory and control activities. An annual survey is required throughout the program to monitor the effectiveness of program activities, make adjustments accordingly, and then verify that eradication is complete. The ALB staff conducts ground survey to inspect areas for infestation prior to confirmation survey and during chemical treatments. Final confirmation of eradication involves at least two years using aerial inspection methods such as bucket trucks and tree climbers. Approximately 27% of the total cost of the program is designated for contracting tree care companies to provide these services for confirmation survey to verify eradication. ALB climbers and USFS smokejumpers, when available, are utilized to augment the contractor tree climbing services.

The cost of the chemical control program is about 40% of the total program. Various methods of application are used with the most effective, in terms of cost and application time, being basal soil injection. In locations that are unable to be soil injected, an alternative method—preferably pressurized trunk injection—is used. Other methods such as micro-injection capsules and standard soil injection, which were used more extensively in the past, are also used in limited areas; however, the personnel, time, and space requirements make them secondary choices.

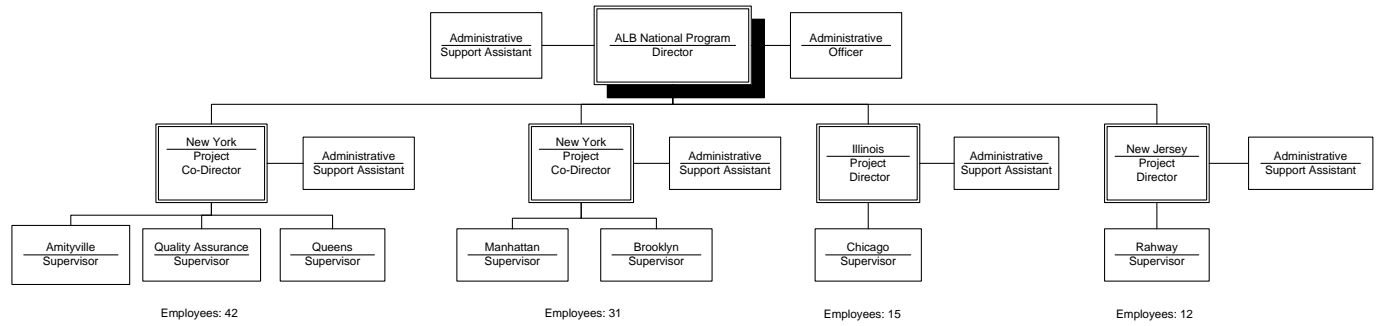
**ALB BUDGET AUTHORITY (dollars in millions)**

FY	APHIS			STATES	TOTAL
	CCC	APPR	Subtotal	Subtotal	
1997	0	0.849	0.849	0.149	0.998
1998	0	1.327	1.327	1.634	2.961
1999	6.910	0	6.910	2.573	9.483
2000	14.080	2.100	16.180	1.555	17.735
2001	49.598	2.100	51.698	2.654	54.352
2002	14.726	16.930	31.656	4.000	35.656
2003	7.000	26.181	33.181	4.000	37.181
2004	12.848	30.003	42.851	4.000	46.851
2005	0	28.933	28.933	10.434	39.367
2006	0	19.859	19.859	10.434	30.293
Subtotal	105.162	128.282	233.444	41.433	274.877

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## X. Staffing

In order to achieve the goals of this strategic plan, the national ALB program employs over 160 Federal, State, and City personnel.



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**Key References**

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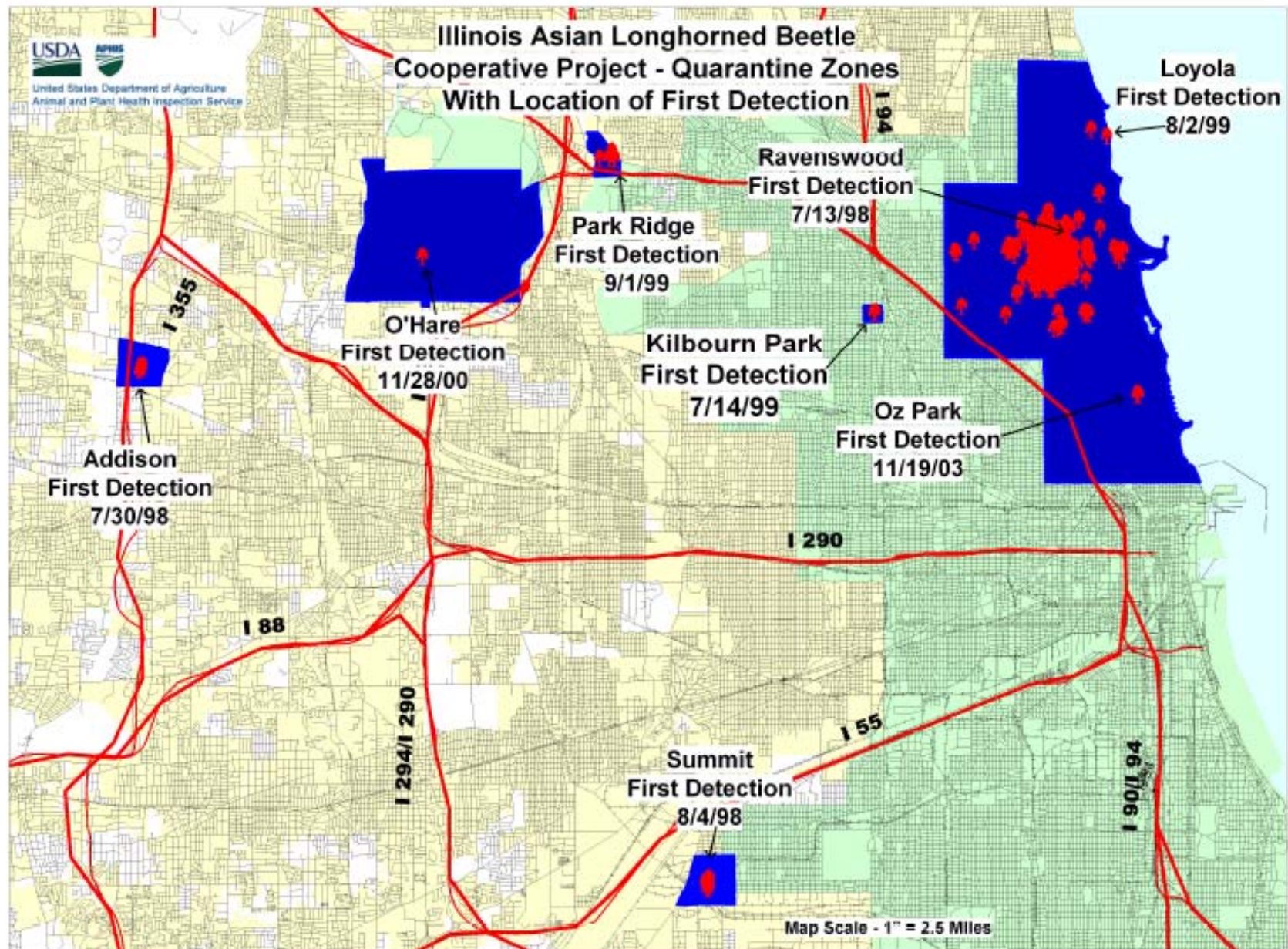
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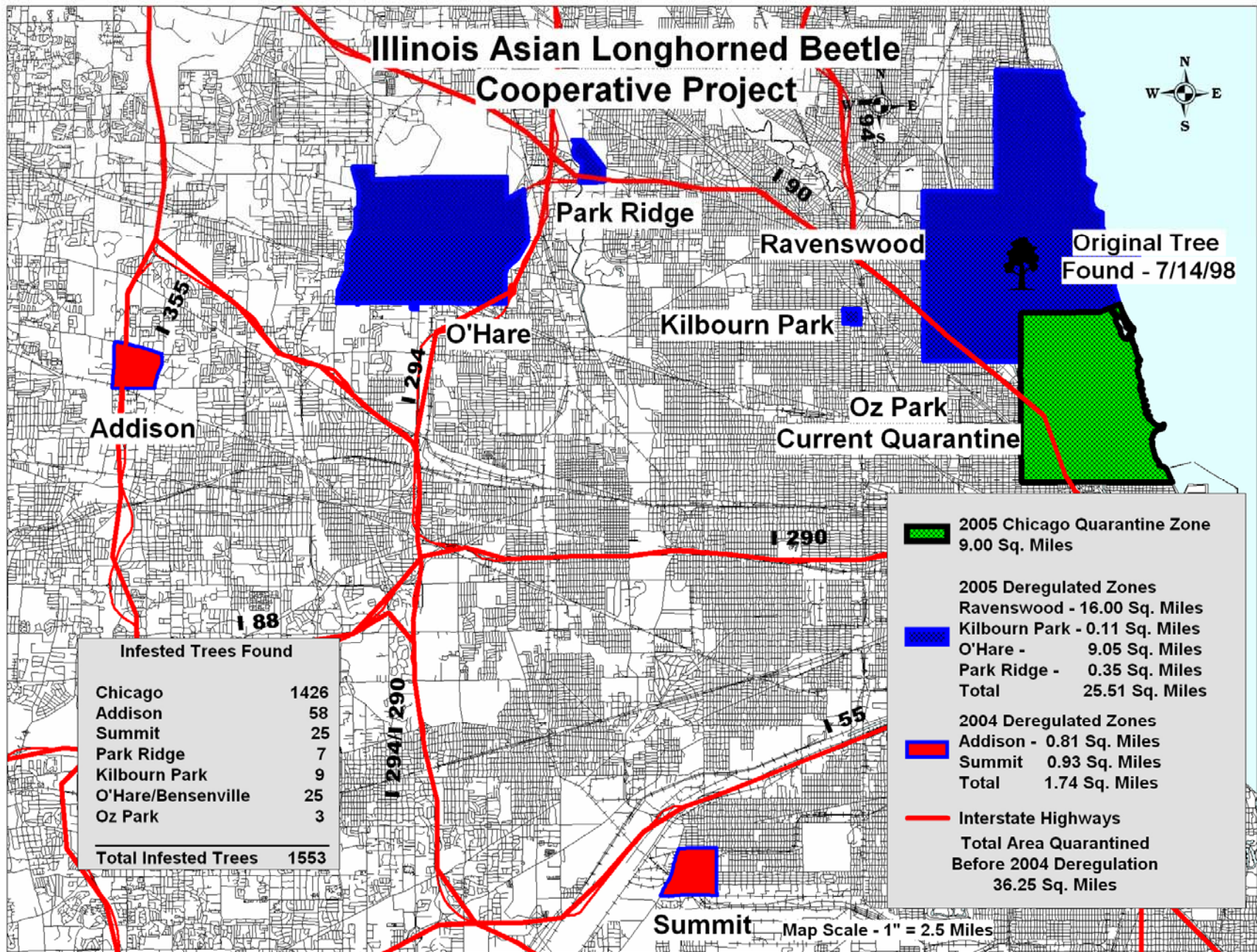
**Contact Information:**

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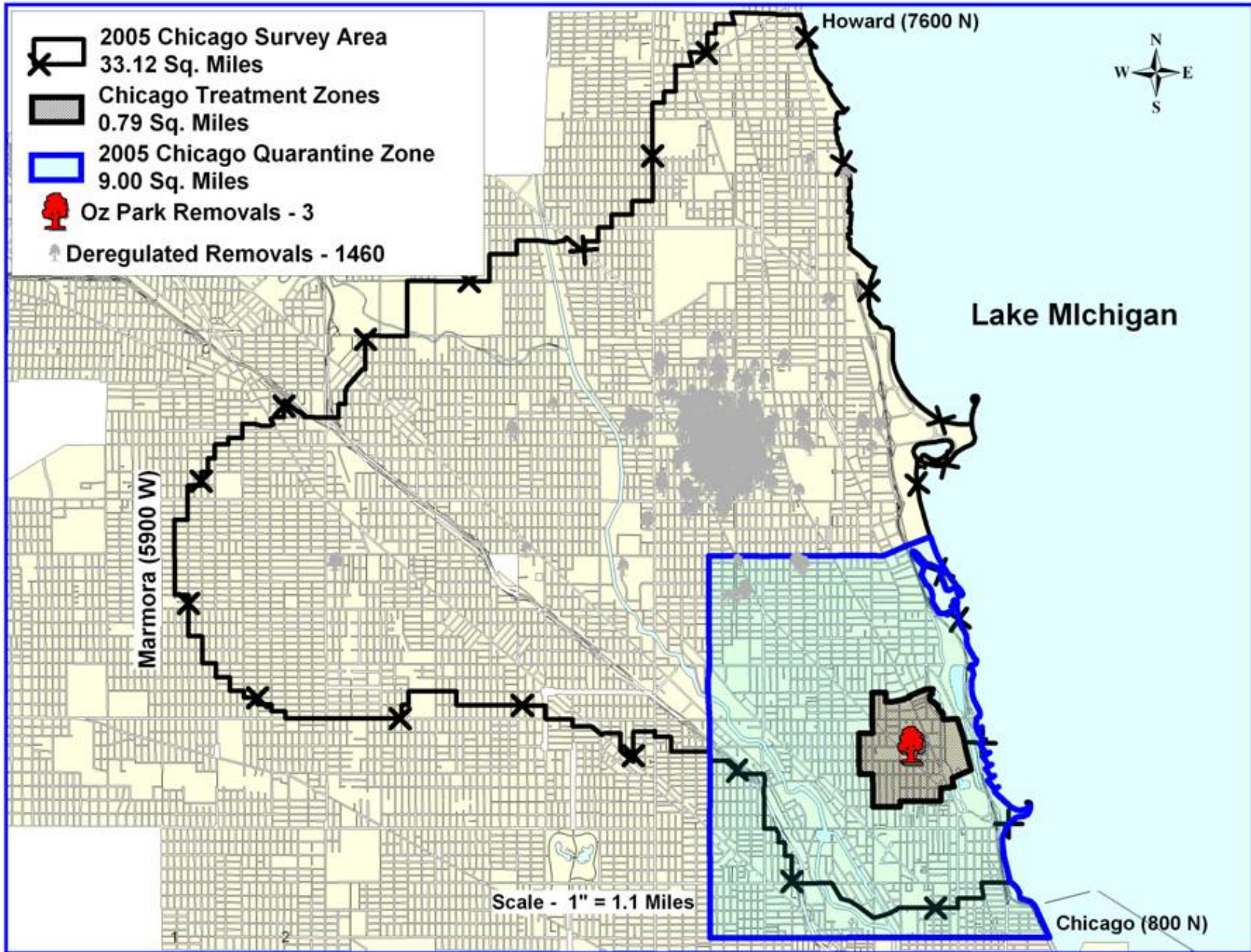
September 25, 2000

Rev. June 5, 2006 by Julie Twardowski, PPQ Officer, USDA, APHIS, PPQ, 4700 River Road, Riverdale, MD 20738 (301.734.5332).





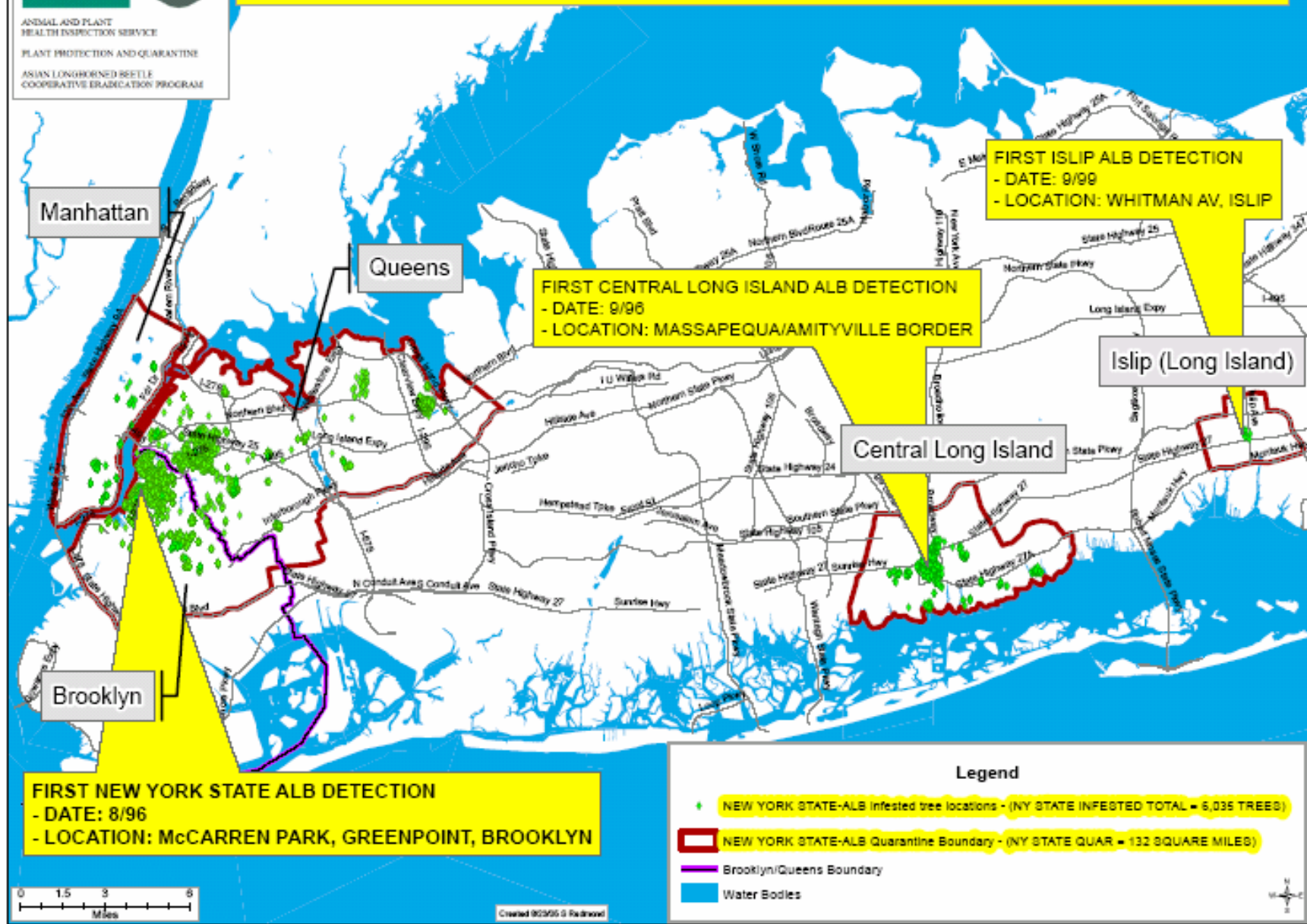


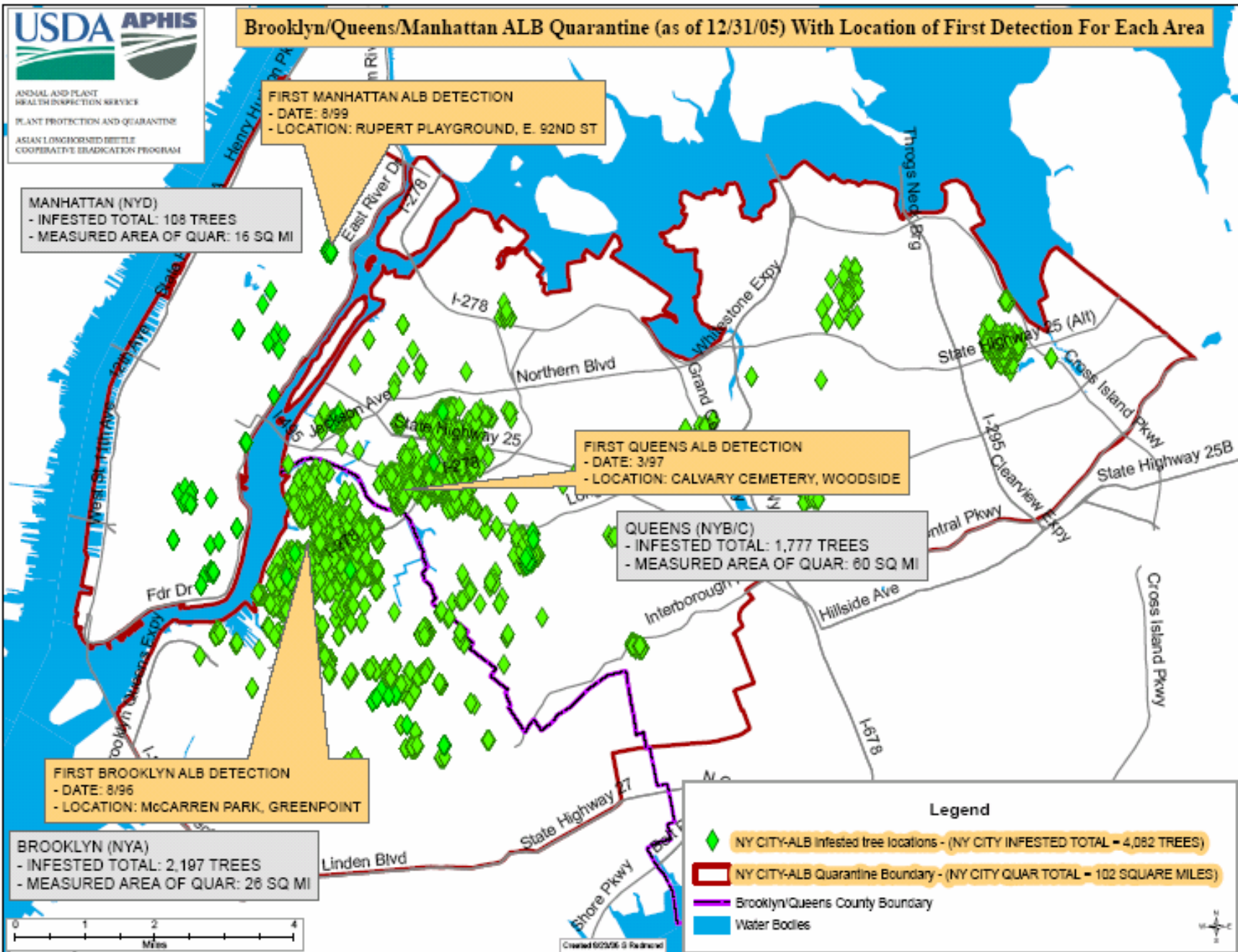


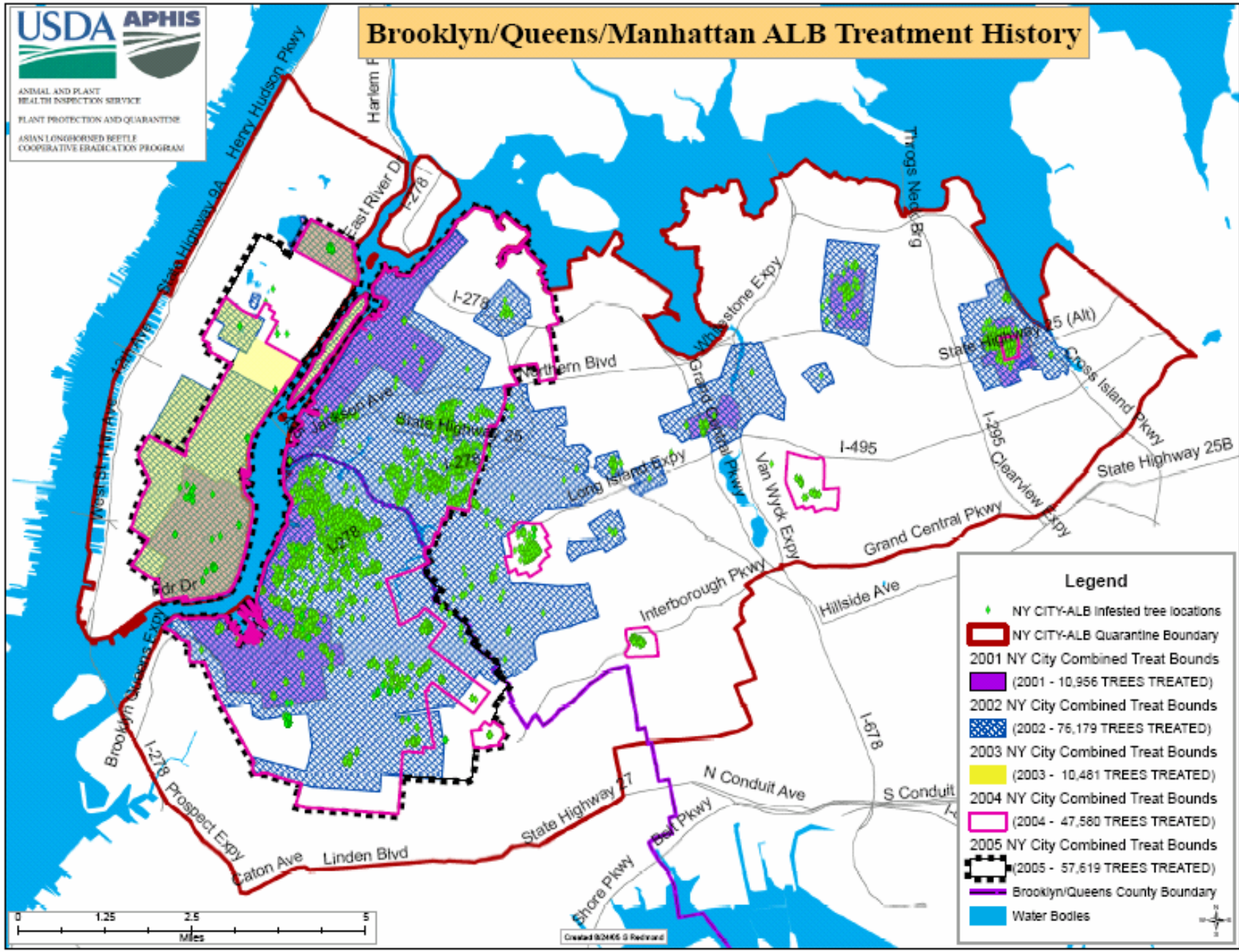


ANIMAL AND PLANT HEALTH INSPECTION SERVICE  
 PLANT PROTECTION AND QUARANTINE  
 ASIAN LONGHORNED BEETLE COOPERATIVE ERADICATION PROGRAM

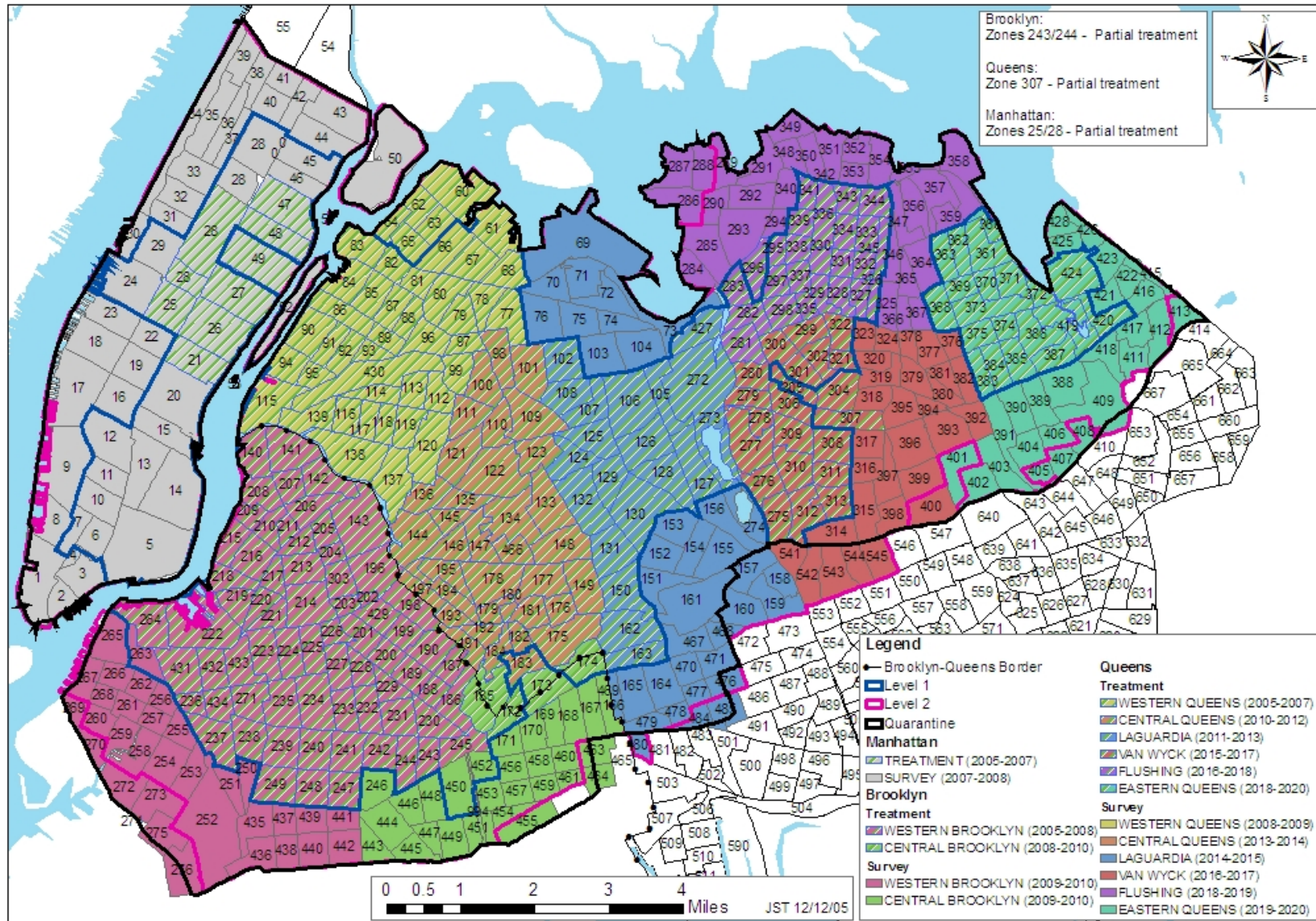
**Entire New York State ALB Quarantine (as of 12/05) With Location of First ALB Detections For Brooklyn, Central Long Island, And Islip (Long Island)**

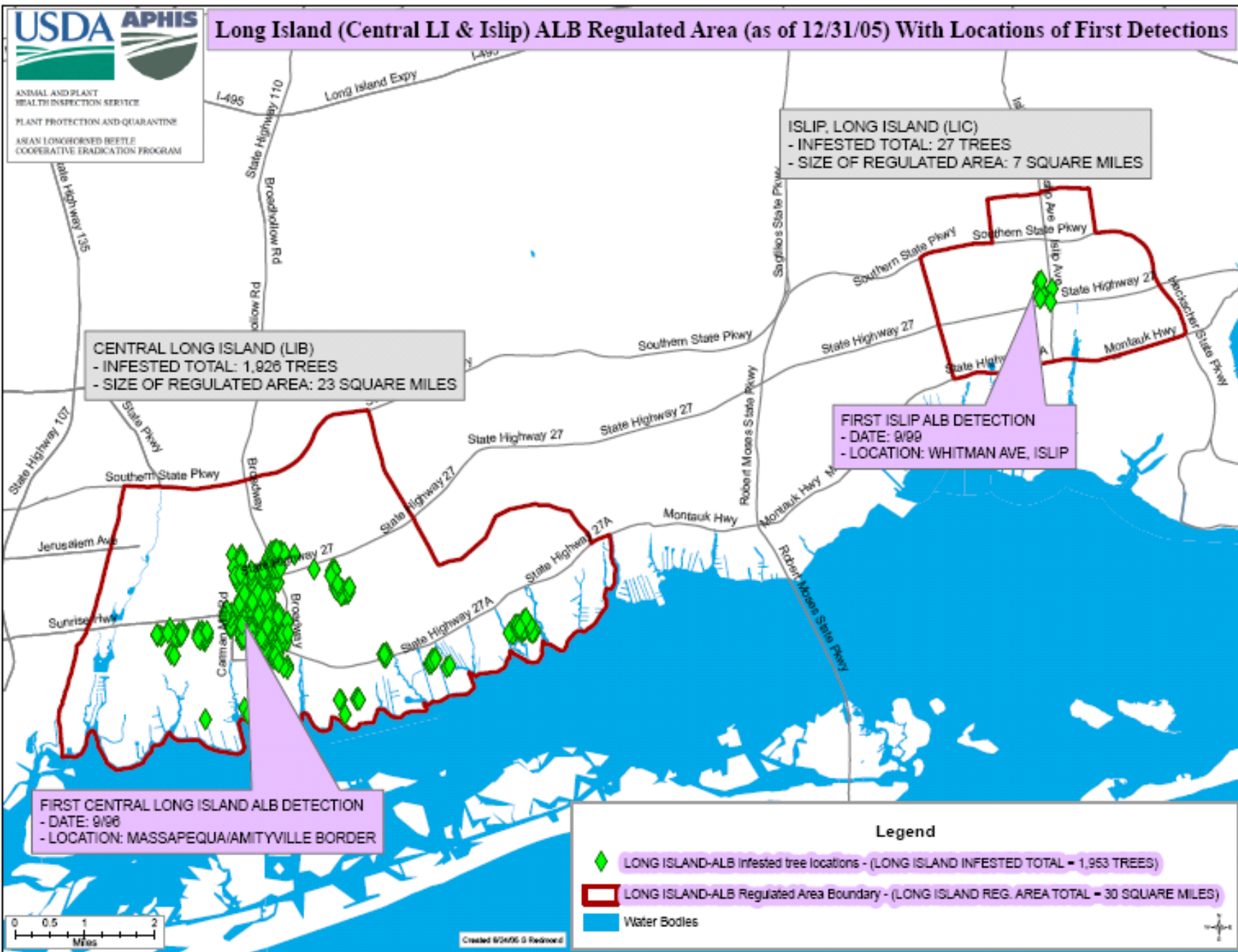


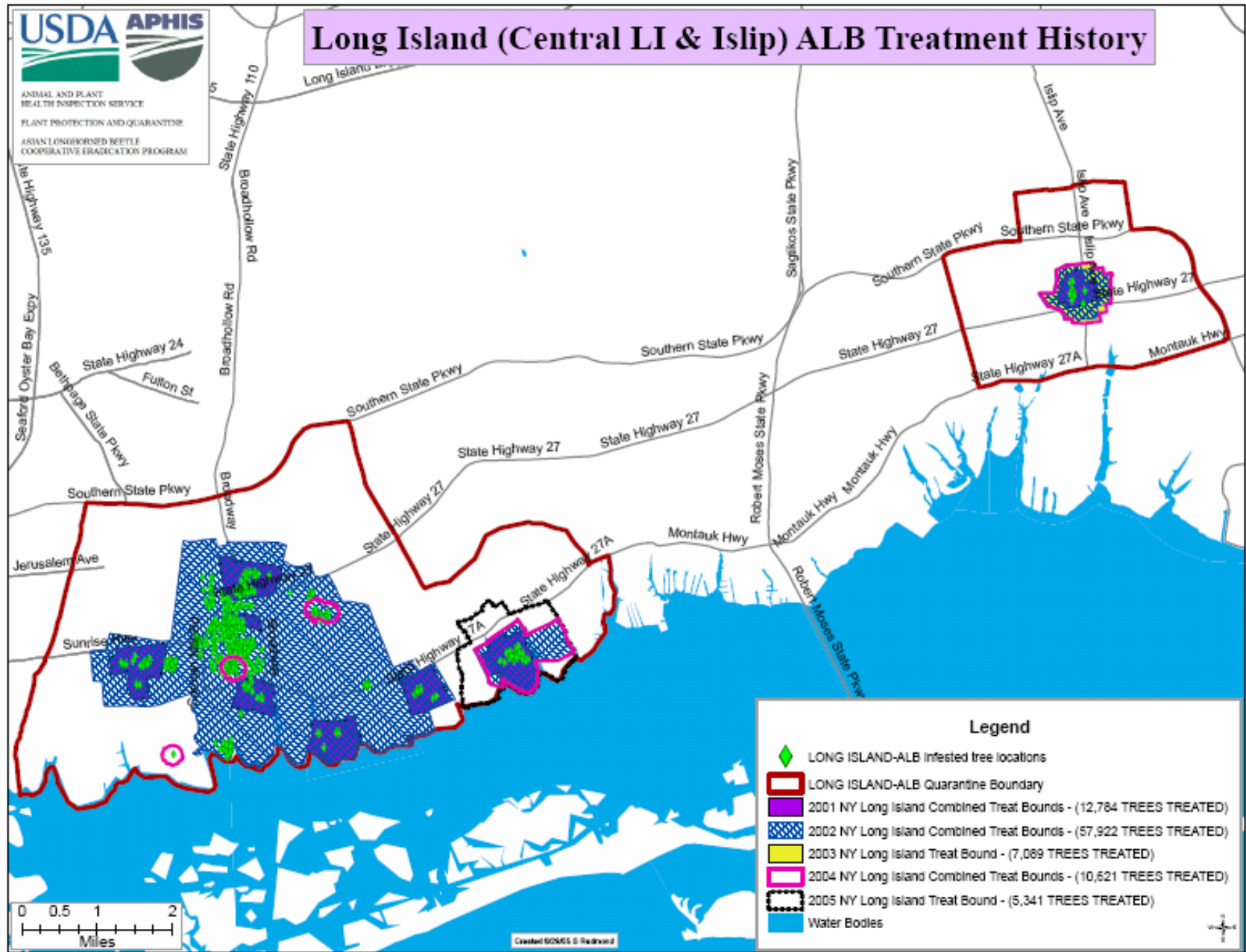




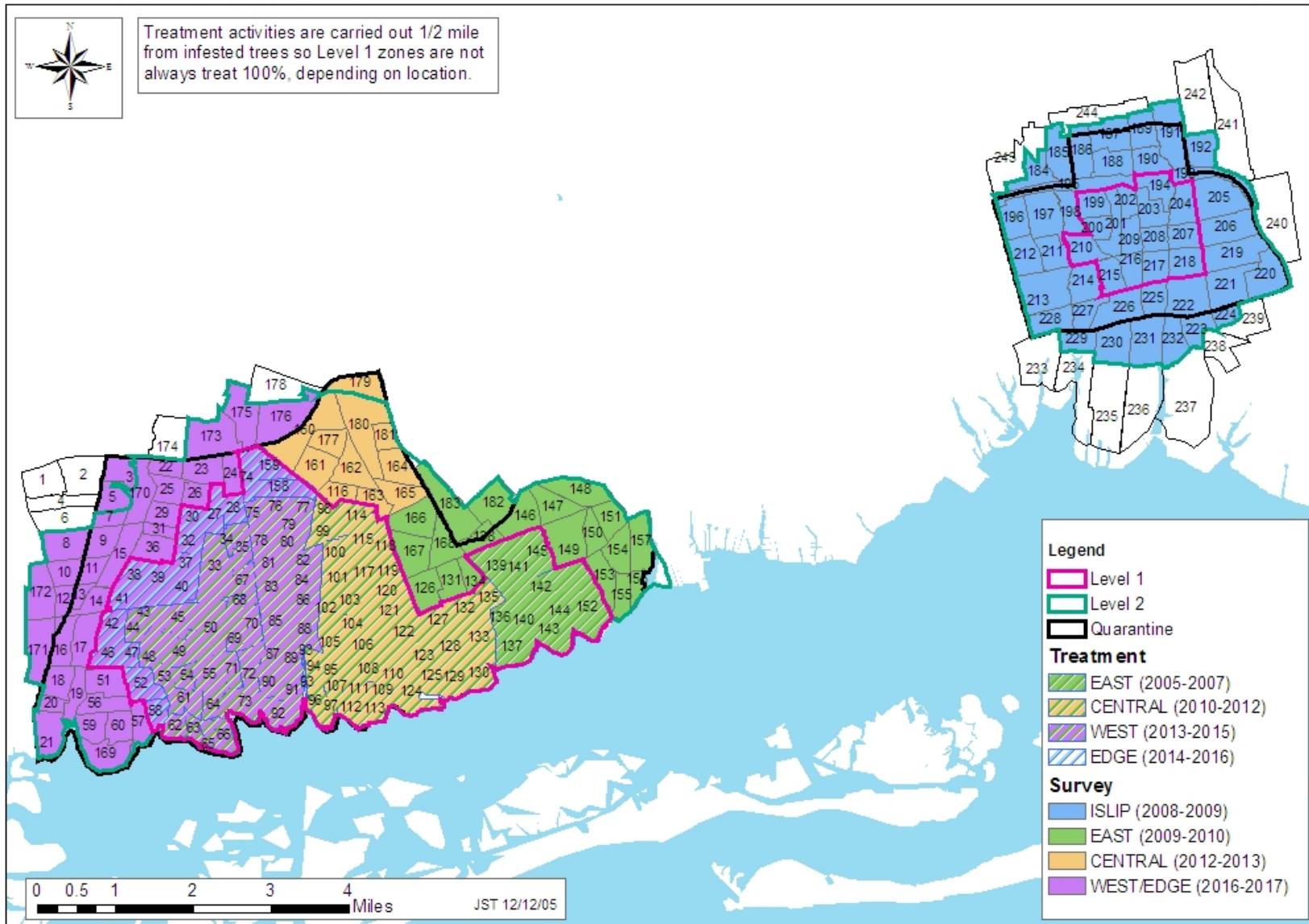
# New York City Treatment and Survey Timeline





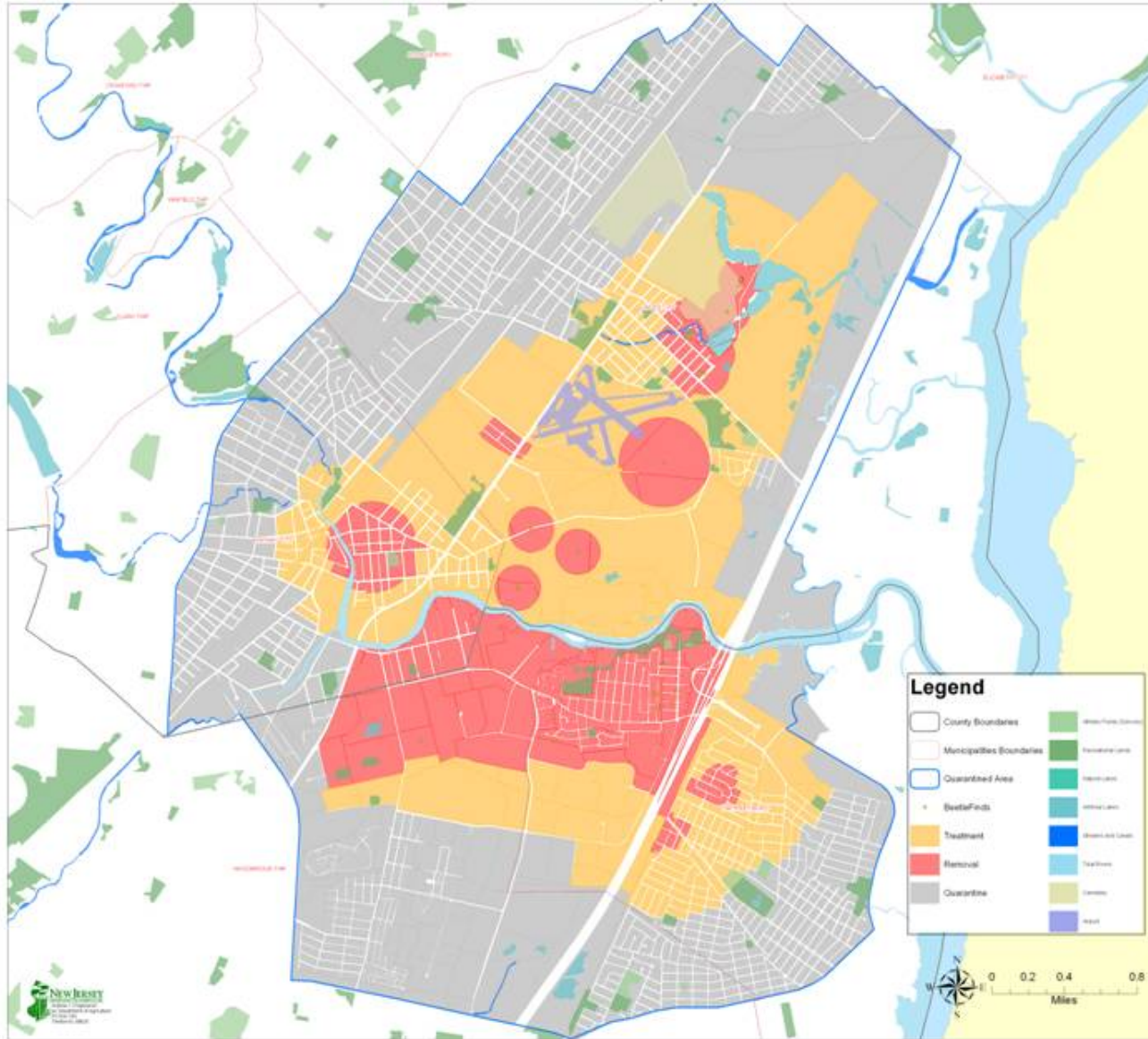


## Long Island Treatment and Survey Timeline





## Asian Longhorned Beetle Treatment and Takedown Map Middlesex/Union Counties, December 2005



# Asian Longhorned Beetle Cooperative Eradication Program

